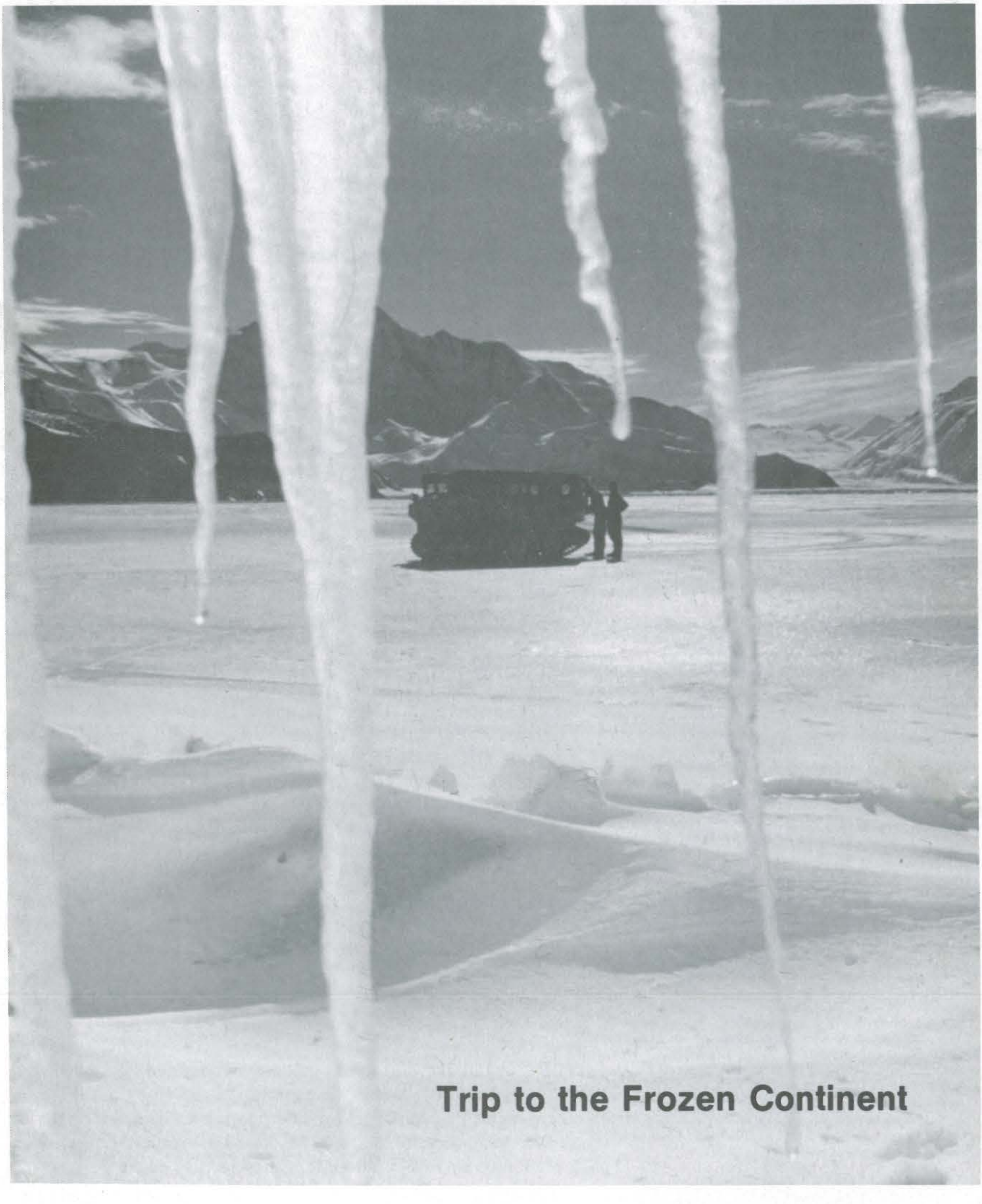
U.S. NAVY MEDICINE

January-February 1983



Trip to the Frozen Continent

U.S. NAVY MEDICINE

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COVER: Since Richard E. Byrd's first Antarctic expedition in 1928 the Navy has played a key role in the exploration and study of the frozen continent. Screening personnel for their rigorous assignments on the ice is a service performed by the Navy Medical Department. Interview on page 18. Photo by PH3 William R. Curtsinger.

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MMART Team Supports Lebanon Deployment

From 29 Aug to 10 Sept 1982, a Mobile Medical Augmentation Readiness Team (MMART) was on station with the Marines in Beirut, Lebanon. The team included personnel from the Disease Vector Environment and Control Center (DVECC), NAS Jacksonville, FL; NRMC Jacksonville; and the Navy Environmental and Preventive Medicine Units No. 2, Norfolk, VA, and No. 7, Naples, Italy.

The job was considerable. West Beirut had been under constant seige and heavy bombardment for over 2 months, sanitation services had ceased to exist, and the public water supply was unpotable. The MMART had many problems to contend with.

Disease Vector Control.

- *Filth Flies.* Major infestations of house, bottle, and flesh flies resulted from accumulated trash, garbage, and human waste. A comprehensive program of residual and aerosol insecticide spraying decreased and maintained the fly population at an acceptable level.
- *Mosquitoes.* Because of dry weather, the mosquito population was limited but still posed a significant nuisance. The team found and treated a few breeding sites for *Culex pipiens.* A limited supply of available repellent was also distributed.
- *Rodents.* The team identified major problems with rodent infestations throughout the operational area, especially outlying areas. A baiting

Photos by DVECC

A santitation survey includes testing the purity of the water supply. Here LCDR Lonnie Crafton, MSC, (left) checks a sample.

program was started to control these problems.

Disease Surveillance System. A disease surveillance system was established to monitor morbidity. Diarrheal diseases presented the greatest risk and produced the greatest morbidity. Still, less than approximately 2 percent of operational forces were affected while in-country, and only 0.5 percent of the total force was sufficiently ill to be transferred to Navy ships for treatment.

Field Sanitation. A great variation in the quality of bivouac areas existed. Personnel residing in some outlying areas were bivouacked in severely damaged buildings where accumulations of trash, garbage, and human waste contributed to significant insect, rodent, and general public health problems. To limit the spread of disease, the team recommended general cleanup, solid waste collection, provision of sanitary facilities and cleaning equipment, personnel training, and relocation of some bivouacs.

Field Water Sanitation. Available municipal water was determined to be nonpotable. To provide safe water, team members established and monitored a field water treatment plant. The plant was dismantled as Marine Corps personnel started withdrawing from the area.

Food Service Sanitation. Food sanitation problems were minimized with use of C-rations and MRE's (Meals, Ready Eat). Navy ships supplied a limited amount of food. Inspection of this food prevented significant problems. Ingestion of local food products resulted in several cases of diarrheal illness.

After returning to their home activities, the vector control and sanitation teams redeployed to Lebanon on 22 Sept 1982 to support the Marine contingent of the international peacekeeping force. They remained there until 6 Dec 1982 when they were relieved by a sanitation team from NRMC San Diego.

—Naval Environmental Health Center, Norfolk, VA. □

LCDR Herb Bolton, MSC, (above) conducts a mosquito survey in the West Beirut port area while HMC Sherman Bonomelli (below) dips for mosquito larvae nearby.

Team members survey for rats . . .

. . . and spray for flies.

MMART members (left to right): LCDR H.T. Bolton, MSC, HMC M.H. Moore, HMC S.L. Bonomelli, HM2 D.A. Treherne, HM1 R.J. Ridenhower, HM2 W.D. Yates, LCDR L.D. Crafton, MSC, LCDR F.D. Daniell, MSC, and HM2 W.R. Johnson.

Stress of Caring for Combat Casualties

RADM Frances T. Shea, NC, USN

The following is a speech given by RADM Shea at the 89th Annual Meeting of AMSUS (Association of Military Surgeons of the United States) in Orlando, FL, 17-21 Oct 1982.

A friend of mine is a professional speechwriter for the Bell Telephone Company. In addition, he prepares seminars for the service academies and industry on how to present successfully. According to him, an in-depth knowledge of the audience is of prime importance. For this group, that is not possible. While there is a commonality in that we are all members of the Federal service medical departments, our experiences and backgrounds are different. Some of you relate to and understand intimately the stress I am about to discuss; others will have difficulty identifying with it. In sharing my thoughts and experiences with you, it is my hope that you never have to experience the stress of caring for combat casualties. But if you do, you might remember that you are not alone.

My presentation is based on personal, not scientific, data. I can only tell you how the stress of caring for casualties in a combat situation affected me. I can also say that in recent years, while exchanging ideas with other Nurse Corps officers having served in Vietnam, I found that our experiences and feelings were quite similar. As a result, we did identify and react to stress in the post-Vietnam years. Although there is an attempt at present to obtain scientific data concerning stress among nurse Vietnam veterans, nothing has yet been published.

Let me say at the outset that I did what I had to do in order to survive emotionally and physically. One adjusts to the initial shock of caring for casualties within a few days or so. Although I had been an operating room nurse with a background in trauma surgery, I was not prepared for the catastrophic casualties that would come to my operating room. My initial feelings were shock, disbelief, hurt, and anger. But, as I said, I quickly adjusted to the fact that the casualties were there and had to be cared for in the best and most efficient manner.

As an operating room supervisor and nurse, I made preoperative visits to all patients in the preanesthesia staging area. I told them they were safe, in a clean environment, and would be cared for soon. I encouraged them to tell me what had happened to them. It was considered to be good psychologically to let the patient debrief as rapidly as possible. They

Photos courtesy RADM Shea

Then CDR Shea as operating room supervisor aboard USS Repose . . .

RADM Shea is Director, Nurse Corps (MEDCOM 51/NC), Deputy Commander for Personnel Management (MEDCOM 05), Naval Medical Command, Washington, DC 20372, and Commanding Officer of the Health Sciences Education and Training Command, Bethesda, MD 20814.

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. . . and with one of her patients.

would tell me how they were ambushed, hit, or tripped a mine. I had no difficulty in this phase of their intraoperative care.

During the 13 months I remember crying once and, even then, that young man was not seriously injured. However, for all the calm exterior, there were patients I can describe to you in most vivid detail even today. One of my nurse friends refers to them as the "patients that got to you."

- The gunnery sergeant, who after his 15th visit to the operating room, finally died. He was the one I told on admission, "Hey Sarge, you are going to make it—it's going to be okay." I was wrong. I never told another casualty he'd make it.
- The 19-year-old who took a direct hit to the scrotum and, with his testicles laying on the gurney, asked me, "Nurse, will I be able to have children?" and, I callously said, "You can always adopt."
- The hemicorporectomy who died as soon as we got him off the table.
- The many marines whose story was always the same: "Nurse, take care of my buddy first."

I could handle the preoperative and operative phase of caring for the patient deliberately, calmly, and unemotionally. What I could not do was visit the patient postoperatively; it was simply too difficult.

Now, I felt guilty about this because if I was a good operating room nurse I should have been able to provide total care. I did not discuss my feelings concerning the patients with anyone on the ship, nor did any nurse discuss her feelings with me. It was as if we led two lives—our working hours caring for casualties and our nonworking hours. The conversations were light and innocuous. We talked about Subic, R&R, or whatever hobbies we might have. We were confined to the ship except for very rare occasions when we might go ashore to Danang for a cold beer and a bowl of chili.

When my tour was up and I returned stateside, I have to tell you that I felt guilty—guilty I didn't do enough, didn't care enough, guilty I left my shipmates and patients behind. This was not an unusual reaction. Many of us experienced similar feelings. My initial return to a naval hospital left something to be desired. Although I welcomed the routine cholecystectomy, I was impatient with the slower-paced running of the schedule, apparent waste of time, the long turnover periods between cases and nonemergent emergencies. I had difficulty hiding annoyance at surgeons who appeared to perform at a lower level of productivity and dedication than those physicians with whom I worked in Vietnam. Eventually, I left the operating room to become an assistant chief and then chief, nursing service.

At this point I realized I couldn't talk to patients, particularly if I knew they might die and this feeling went on for years compounding the guilt. How could I be a good nurse and dread patient contact? Each morning at 0630 I made rounds in the ICU's. The staff thought I was great, but I knew the truth. If I didn't force myself to visit patients, I wouldn't do it at all. I could not share with or console families at the stateside hospital any more than I could have on the ship.

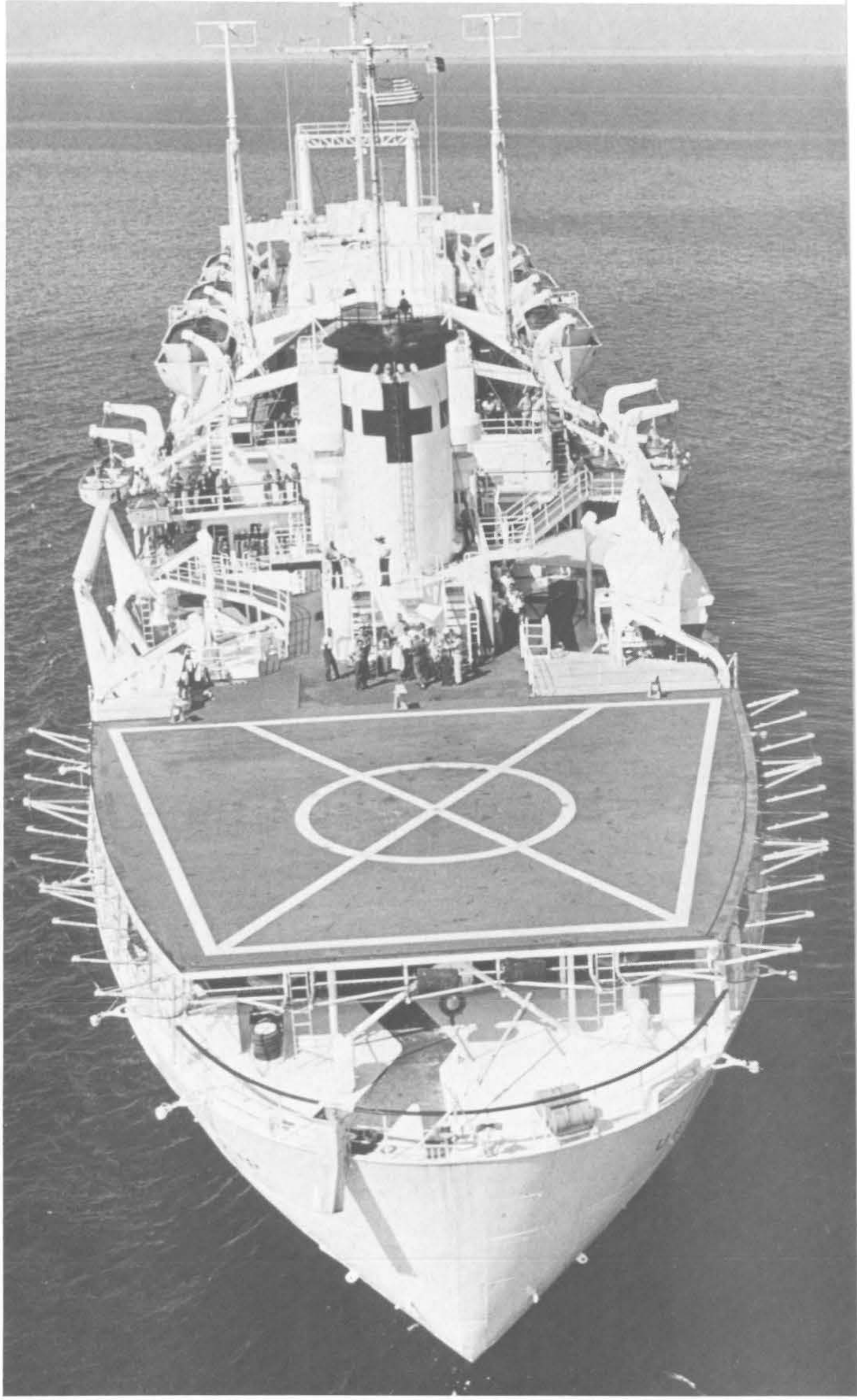
A *Repose* patient's father was a colonel stationed in Saigon. He had come aboard to be with his dying son. The son had multiple trips to the operating room. I would see the father in the ward room looking for some kind of hope, consolation, and support, but I was unable to help him. I avoided him because I feared I would cry and, if the floodgates opened, I wasn't certain I could close them. I still feel remorse over that.

Specific stress hinted at, but not discussed openly, is the stress of being a woman in the combat arena in a primarily male environment. The woman becomes a substitute mother, wife, lover, sister—the shoulder to cry on. You listen to the corpsmen, physician, ship's company officers, and enlisted—anyone who needs to ventilate and to talk about the sick father, the unfaithful wife, or the child on "pot" flunking school. You "ooh and aah" over the new baby pictures. Even the chaplain seeks out the nurse with his problems. It was okay to discuss problems with the nurse—the woman. The men seemed to be able to share some aspects of their lives with women that they could not, or would not, share with men. But, the nurse—the woman—would not share with anyone, not with other nurses, staff, or line personnel. We might have seen ourselves as being judged weak, not being able to take it, and decided not to share our own problems with others —to tough it out.

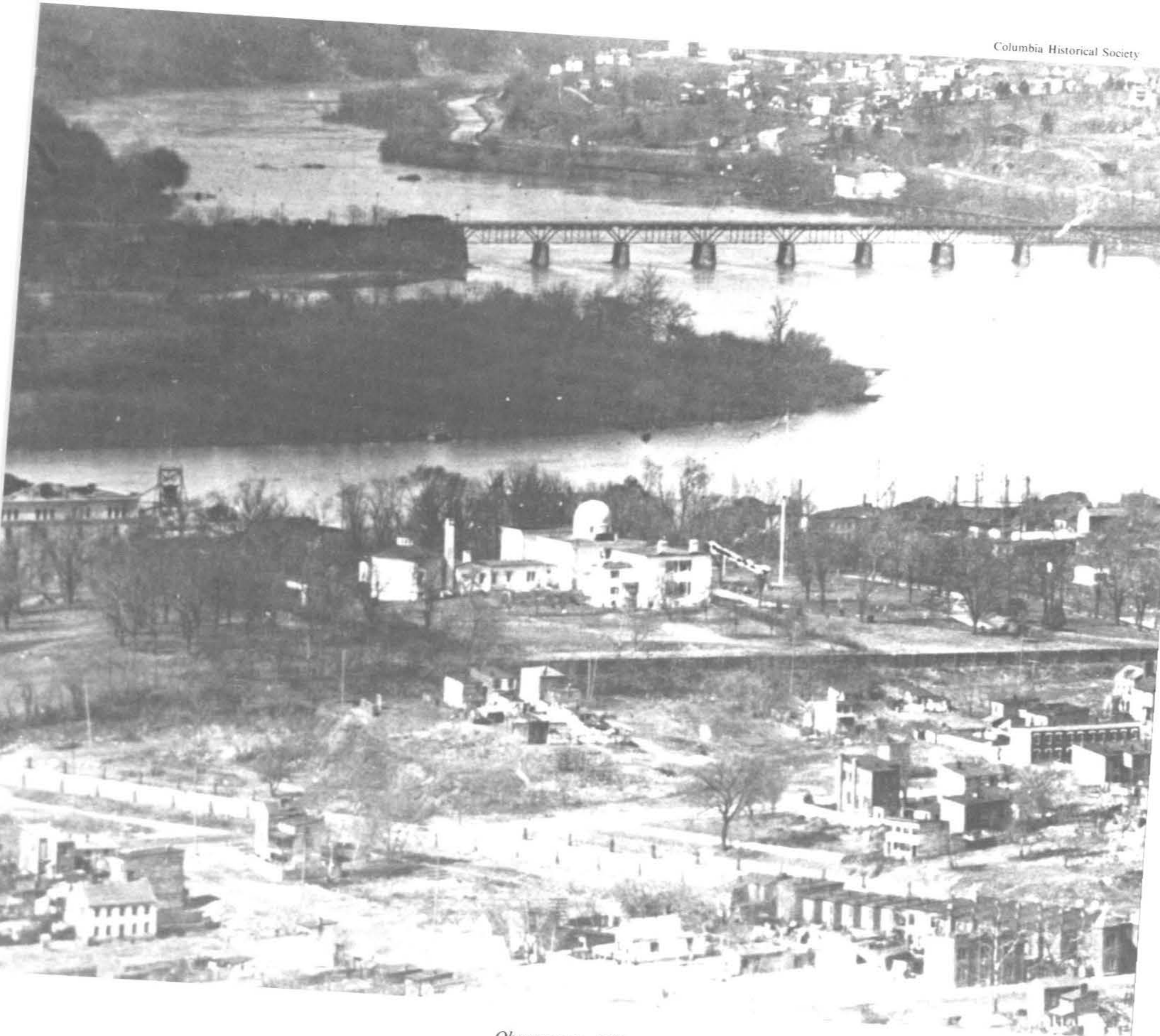
The nurse accepted this role and responsibility. With all her concerns for patients, she worried about the amount of sleep the surgeon and anesthetist had and wondered whether or not there was a way she could keep from calling them for 1 more hour. She tried to keep the corpsmen, who were so tired and stressed, from getting into difficulty. That sometimes meant having to take on the ship's commanding officer. The nurse had to console the chaplain who had experienced his first massive casualties. She had to tell him that no matter how hard we tried and prayed, we couldn't save the 18-year-old marine with a gunshot wound to the head and who was already decerebrate. I have no problem with the nurse—the woman—being a consoler, comforter, and sympathetic listener. However, I feel that this role heightens the stress she has already been experiencing.

Although most were able to cope during the periods of heavy casualties, I think that many, including myself, felt the stress once the pressures were off and we were home. For me, understanding and admitting I had been through a stressful period was therapeutic. I have no difficulty visiting patients now—I can talk openly about experiences that were painful. That does not mean to say that I won't get teary-eyed. I think it is a phase of caring for casualties that we need to recognize that we are affected and are going to react to stress sometime or another.

For me, the stress of caring for casualties is like going to a supermarket where you are loading groceries into a paper bag. You only have that one bag and you keep piling those groceries in. If it doesn't overflow from the top the seams are going to burst. It is my feeling that the personal stress experienced in caring for casualties will take its toll emotionally somewhere along the line. □



The crew and medical staff of USS Repose *saw many combat casualties of the Vietnam War.*



Columbia Historical Society

Observatory Hill as seen from atop the Washington Monument about 1900.

Home of BUMED
a hilltop in foggy bottom

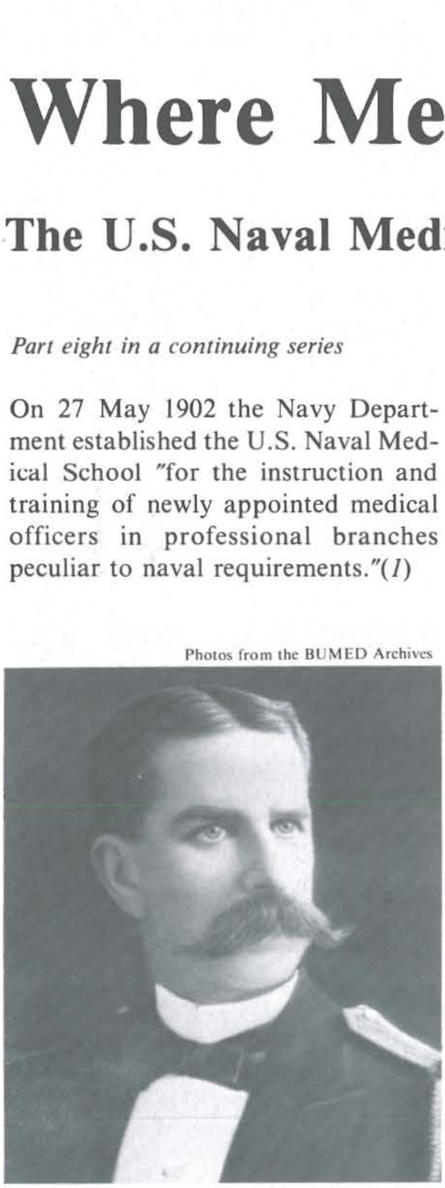
Where Medical College Left Off

The U.S. Naval Medical School and Naval Hospital 1902-1917

Part eight in a continuing series

On 27 May 1902 the Navy Department established the U.S. Naval Medical School "for the instruction and training of newly appointed medical officers in professional branches peculiar to naval requirements."(*1*)

Photos from the BUMED Archives



Surgeon General Presley M. Rixey, once White House physician and friend of Theodore Roosevelt, supervised the establishment of the Naval Medical School.

The Medical School was the Navy's latest attempt to create an institution in which to train newly commissioned physicians in the ways of military medicine. There were precedents. Surgeon William P.C. Barton, who later became the first Chief of BUMED, recommended the establishment of a medical school as early as 1809. In 1829 Congress established the medical examining boards to determine professional fitness of those seeking admission to the Navy as physicians. Surgeon General of the Navy Joseph Beale revived the idea of a formal medical school again in 1873. His successor, William Grier, authorized formal instruction at the Naval Hospital, Brooklyn, NY. The 2-year curriculum stressed naval hygiene and military surgery.

Surgeon General J.R. Tryon inaugurated a 3-month course at the U.S. Naval Laboratory and Department of Instruction in Brooklyn in 1893. There, newly commissioned medical officers received postgraduate instruction in chemistry, hygiene, microbiology, microscopy, military and operative surgery, clinical medicine and hospital work, construction and ventilation of modern warships, examination of recruits, lifesaving methods, naval regulations, naval rations, and administration.(*2*) The graduates were then sent to sea or general duty. The school operated until the outbreak of the Spanish-American War in 1898.

The close of that short but controversial conflict heaped new responsibilities upon the United States. There were the spoils of war to administrate—Guam, the Philippines, Puerto Rico, and Cuba. The Nation was now a Pacific naval power with new ships, new stations, and enlarged hospitals. Medical officers had to be trained to staff the new facilities and handle an influx of recruits.

Naval Medical School

The plan envisioned by Surgeon General of the Navy Presley M. Rixey called for moving the moribund course from the U.S. Naval Laboratory in Brooklyn and consolidating it with the Naval Museum of Hygiene in Washington. At the same time, as part of the reorganization, the Naval Medical Examining Board, that body responsible for screening incoming physicians, would also move to Washington.

These plans seemed quite appropriate. The Museum, with its laboratories, classrooms, and fine library, was ideally suited. Moreover, the staff formed the nucleus for an excellent faculty and the city offered a seemingly endless supply of military and civilian medical specialists as guest lecturers. The officers assigned to the Medical Examining Board could also serve as instructors.

Further alterations of the old Observatory, now Museum of Hygiene, were necessary. By the end of 1902 an additional story had been added above the structure's two connecting wings to accommodate more laboratory space. With a reverence for tradition, the architect was lenient with the building's neoclassical design; only a trained eye could distinguish the new construction.

The east wing, long the residence of the Observatory's superintendents and now the Museum's medical officer in charge, was vacated to furnish office space for the Medical Examining Board.

The new labs for pathology, clinical microscopy, bacteriology, and medical zoology contained 26 working spaces, each with a plate glass topped desk set on rubber matting and supplied with microscope and accessories, gas, electric light, and water. Outside the lab was a large, 37°C incubator with separate compartments for use by the students. Other incubators and ovens were also available for experiments.

The chemical laboratory contained 32 working spaces with equipment necessary to analyze milk, water, gases, etc.

The basement housed a specially constructed room for photography and photomicrography and a cold storage room kept just below 0°C.(*3*)

The consolidated Museum-Medical School library continued to grow in the south wing rotunda. The collection contained the leading foreign and domestic medical journals in addition to all the standard works on medicine and surgery.

Medical Director Robert A. Marmion became the School's commanding officer and presided over the first 12-member class. That first course of instruction was 5 months long with a curriculum covering microscopy, naval hygiene, military surgery, military medicine, duties of the naval medical officer ashore and afloat, military law, and a program of physical exercise and military drill akin to what any student might experience in a military school or service academy.

Because tropical disease had accounted for many of the casualties suffered in the recent war with Spain, it was a chief focus of attention. The School soon became the first important center for this specialty in the country. Physicians with clinical experience in tropical disease came to lecture, among them yellow fever pioneer COL William C. Gorgas, USA.

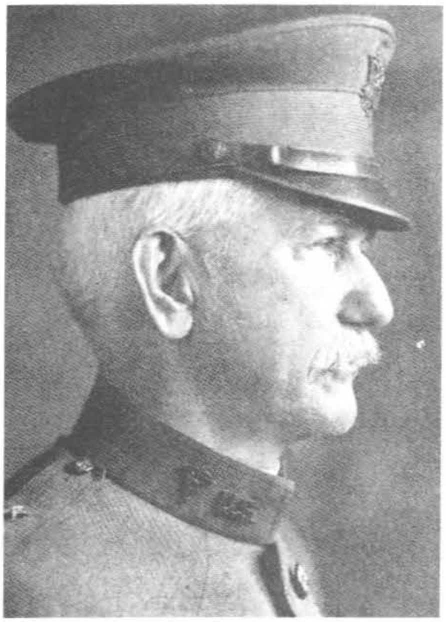
On 4 April 1903 the first class graduated. Surgeon General Rixey enthusiastically reported the event to the Secretary of the Navy. "The need of a preliminary course of instruction for the novitiate of the Medical Corps before taking up active duty was fully demonstrated in the class work, and already, in the few months since graduation that the members of the class have been actively employed, the value of this school training has been practically brought to the front."(*4*)

Even as the second class of 31 commissioned assistant surgeons convened in 1903, Observatory Hill was about to witness a building boom that would transform it into a medical complex.

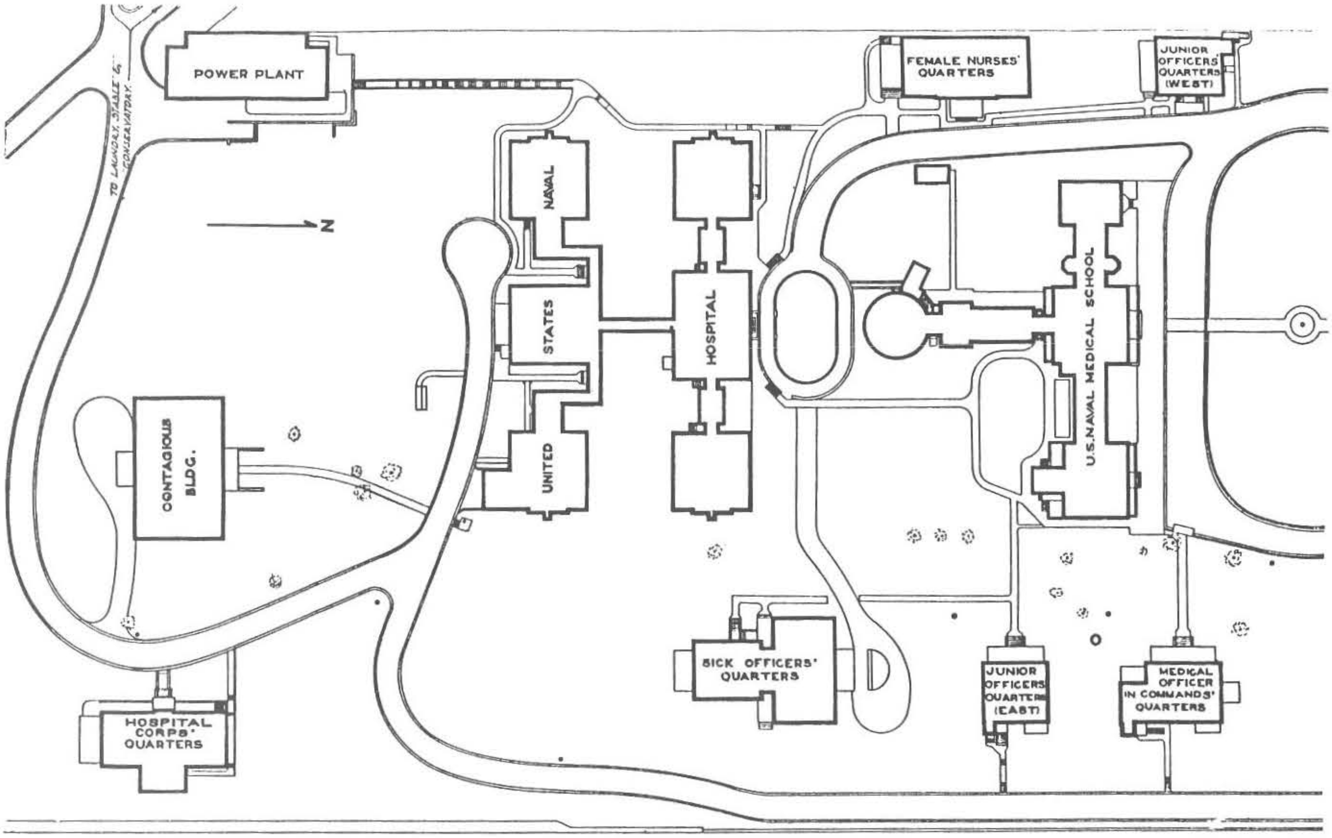
Naval Medical School Hospital

The Washington Naval Hospital, located on Pennsylvania Avenue and 10th Street SE had, for many years, been cramped, antiquated, and unable to house patients properly. There had been moves to construct a new hospital elsewhere in the city. On 3 March 1903 Congress appropriated $125,000 for construction of a new Washington Naval Hospital on Observatory Hill. The complex was to include a three-

The transformation complete: By the close of 1902 the connecting wings had an upper story to accommodate the Medical School's new laboratories. A somewhat radical tree-pruning operation had already taken place.



COL William C. Gorgas, the world's leading authority on yellow fever, lectured students and faculty.


POWER PLANT
TO LAUNDRY, STABLE & CONSERVATORY
N
FEMALE NURSES' QUARTERS
JUNIOR OFFICERS' QUARTERS (WEST)
NAVAL
STATES
UNITED
HOSPITAL
U.S. NAVAL MEDICAL SCHOOL
CONTAGIOUS BLDG.
SICK OFFICERS' QUARTERS
JUNIOR OFFICERS QUARTERS (EAST)
MEDICAL OFFICER IN COMMANDS' QUARTERS
HOSPITAL CORPS' QUARTERS

Completed Naval Hospital and Medical School reservation

[The class will report every week day, national holidays excepted, in time to be ready for instruction to begin at 9 o'clock a.m.]

Forenoon

Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Physical drill	9:00— 9:10	9:00— 9:10	9:00— 9:10	9:00— 9:10	9:00— 9:10	9:00— 9:10
Signals, tactics, etc.	9:15— 9:40	9:15— 9:40	9:15— 9:40	9:15— 9:40	9:15— 9:40	9:15— 9:40
Hospital corps drill	9:45—10:00	9:45—10:00	9:45—10:00	9:45—10:00	9:45—10:00	9:45—10:00
Section A: Bacteriological laboratory	10:00—12:30		10:00—12:30		10:00—12:30	
Section B: Chemical laboratory	10:00—12:00		10:00—12:30		10:00—12:30	
Both sections, lectures: Duties of naval medical officers		10:00—11:00				
Military diseases and tropical medicine		11:00—12:00				
Both sections, lecture: Hygiene				10:00—11:00		
Chemistry				11:00—12:00		
Both sections: Miscellaneous						10:00—12:00

Afternoon

Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Section A: Chemical laboratory	1:00— 3:30		1:00— 3:30		1:00— 2:30	
Section B: Bacteriological laboratory	1:00— 3:30		1:00— 3:30		1:00— 2:30	
Miscellaneous	3:30— 4:30	2:30— 3:30	3:30— 4:30			3:00— 4:30
Both sections: Military surgery		12:30— 1:30				
Bacteriology		1:30— 2:30				
Naval law		3:30— 4:30				
Both sections: Miscellaneous				1:00— 2:00		
Ophthalmology				2:00— 4:00		
X-ray work (Army Medical Museum)					3:00— 4:30	
Both sections: Laboratory						12:30— 3:00

Schedule of instructions and exercises at the Naval Medical School 1903-1904.

story administration building, a subsistence and operating building, four small one-story pavilion wards, and a power plant, laundry, and stable. The renowned architect Ernest Flagg* drew the plans, the contract was awarded, and construction began on 22 May 1904.

The hospital building was completed 1 year later but the money ran out before many of the fixtures were installed. It took another appropriation of $20,000 to build the southeast and southwest wards. On 1 Oct 1906 the yet to be completed hospital admitted its first patients.

The Bureau of Yards and Docks prepared plans for the hospital's other buildings. These included the contagious disease hospital, quarters for hospital corpsmen, sick officers' quarters, nurses' quarters, and three houses for junior and senior medical officers.

The new hospital buildings, faced with buff vitreous brick and uniform in appearance, had structural steel frames, concrete floors and ceilings, and were slate-roofed. Floors of yellow Georgia pine were laid on sleepers bedded in cinder concrete.

The central power plant supplied electricity and heat to the entire complex. The buildings had independent hot water or steam heating systems with thermostatically controlled radiators.

Both the main hospital and the contagious disease building had unique heating and ventilation systems. Gauze filters purified incoming air in the hospital and a water air-washer did likewise for the contagious disease building. Heating stacks warmed incoming air and a damper regulated temperature automatically by channeling incoming cold air through a bypass.

The main hospital (now Buildings Three and Four) consisted of a central three-story administration building, an operating room in the rear, and four one-story wards, one on either side of the buildings connected by solarium corridors.

The administration building basement contained a space for hydrotherapy, a darkroom, X-ray room, and medical and dispensary storerooms. The main kitchen, pantry, patient and employee mess areas, and refrigerator room were housed beneath the operating room.

Below the wards were individual machinery rooms containing blowers, heaters, and serving and linen rooms. There was a suite of rooms for the outpatient clinics in the basement of the northwest ward, a messing area for corpsmen in the basement of the

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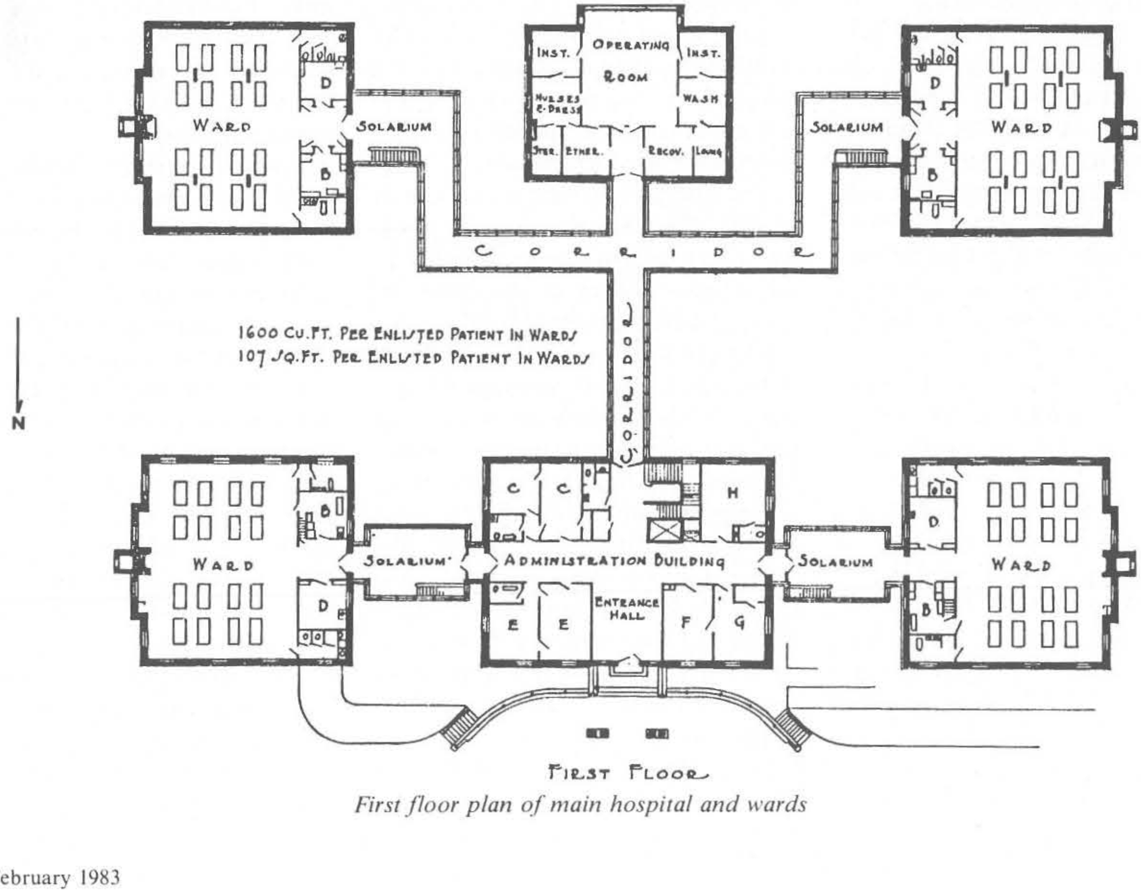
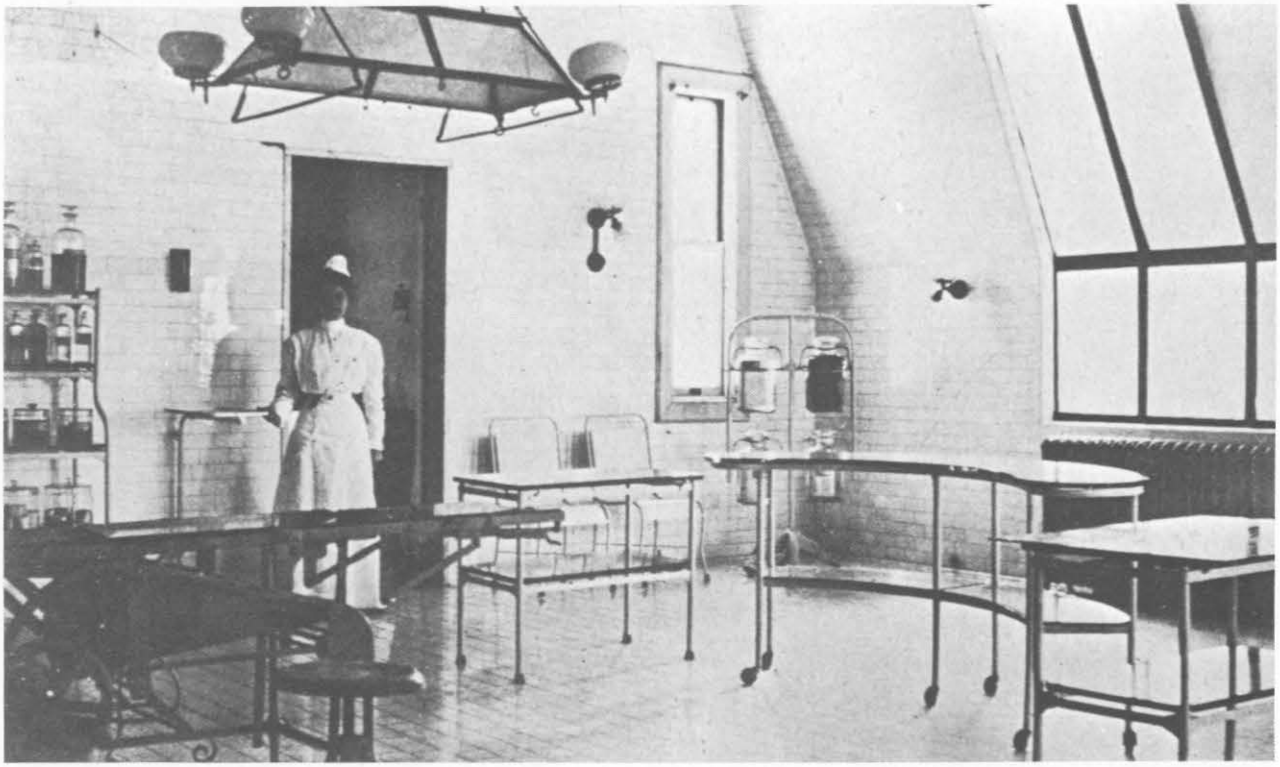
*Among Flagg's other designs were the Singer Building in New York City, the Corcoran Gallery in Washington, DC, and several buildings and the hospital at the Naval Academy in Annapolis.



First floor plan of main hospital and wards



The new hospital's white-tiled operating room

southwest ward, and in the southeast ward, a garage, disinfector, and the mortuary and autopsy rooms.

A porte-cochère protected the hospital's main entrance on the north. Its roof served as a sunporch for second-floor patients. A hall led from the entrance vestibule to the rear and laterally to the ward corridors. The first floor housed the offices of the commanding officer, the executive surgeon, officer of the day, record clerks, toilets, and a telephone and orderly station.

The second floor had six rooms for sick officers, a dining room, and a pantry. Rooms for corpsmen were maintained on the third floor. The south side of the floor housed the operating department consisting of anesthesia and recovery rooms, a dressing and instrument room, and preparation rooms. The floors and wainscot were tiled, the walls finished in white enamel; the ceiling was of pressed sheet steel. Because it faced south, the operating room was extremely hot in summer. When the Sun bathed the room after midday, glare from the stark, white walls was so intense it was said to be dazzling.

Each of the four wards accommodated 18 patients, including 2 in a quiet room. The heavily glassed connecting corridors, widened near each ward, were used for solaria.

The quarters for sick officers (now Building Five) was a three-story building with a large portico supported by six wooden pillars at the front entrance extending to the third floor. Beneath this, on a level with the second floor, was a smaller portico immediately over the entrance. Both porticoes served as verandas for the corresponding floors. The first floor had an office, a reception room, library, a nurses' dressing and medicine room, diet kitchen, and five patient rooms. The second and third floors had 17 bedrooms and service rooms. Two spaces on the second floor were used for an operating room and dressing room.

The contagious disease hospital (now Building Six) accommodated four classes of communicable disease. The basement contained a receiving room for patients, a disinfecting plant, main kitchen, serving rooms, a dormitory and mess rooms for attendants, a mortuary, storerooms, and a machinery room. The other two floors were arranged similarly, each being bisected by a wide corridor running north-south and open at each end. This allowed for free circulation of air.

On either side of this corridor's south end on each floor was a six-bed ward and attached to each, a diet kitchen with an independent dumb waiter to the basement and serving room, a toilet and lavatory, and two quiet rooms. In addition to the four isolation units there were two rooms for nurses and an office and suite of rooms for a resident medical officer. The entrance to these wards from the open corridor was through a vestibule with a door at either end.

The nurses' quarters (now Building One) contained in the basement a kitchen, storerooms, and a bedroom for attendants. The first floor featured quarters and an office for the head nurse, a reception room, lecture room, and dining room. The second and third floors had accommodations for 18 nurses.

The two-and-a-half story corpsmen's quarters (now Building Seven) had accommodations for 57 men, an office, lecture room, recreation room, and mess areas.

Three coal-fired, 90 horsepower generators supplied power to all hospital buildings; the same boilers also generated steam and hot water for the entire complex.

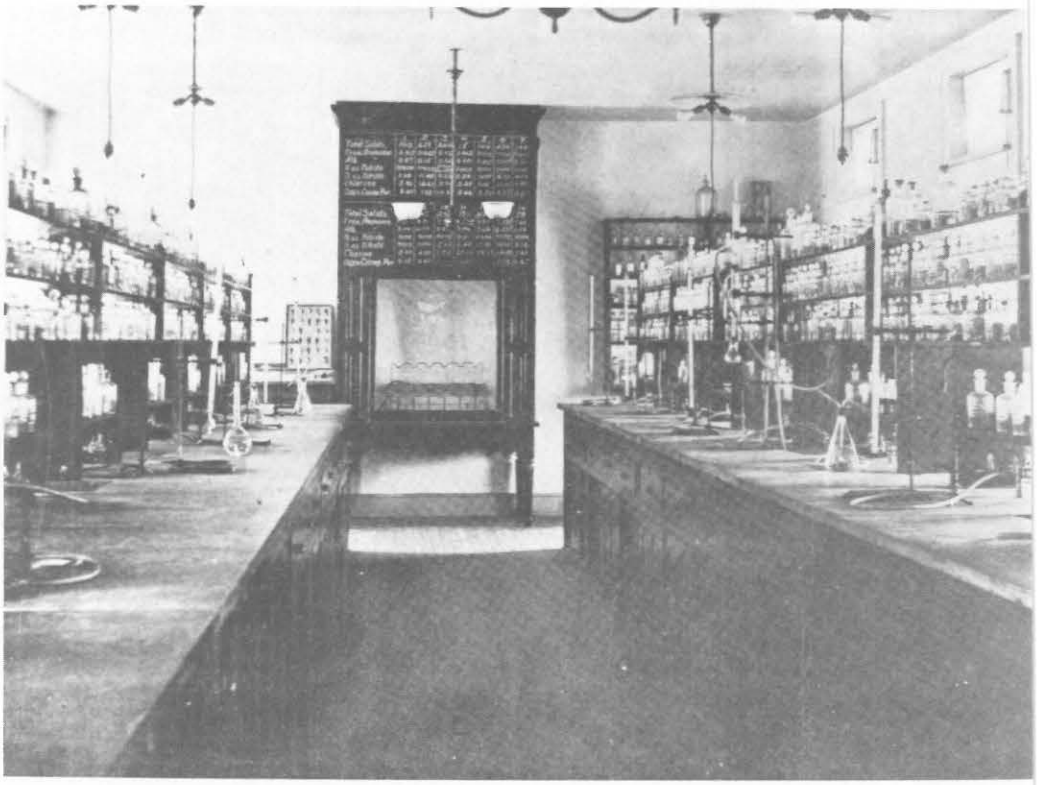
Total patient treatment capacity for the hospital was 130 beds—78 beds for the main hospital, 22 beds for the quarters for sick officers, and 30 beds for the contagious disease hospital. Expansion to 175 total beds was possible. By reconfiguring the corpsmen's quarters, capacity could total 240 beds.(*5*)

By the close of 1908 the complex was nearing completion. At the rear and southwest of the main hospital, a steam laundry, stable, and greenhouse took their places beside the existing power plant. Concrete walks now crisscrossed the compound.

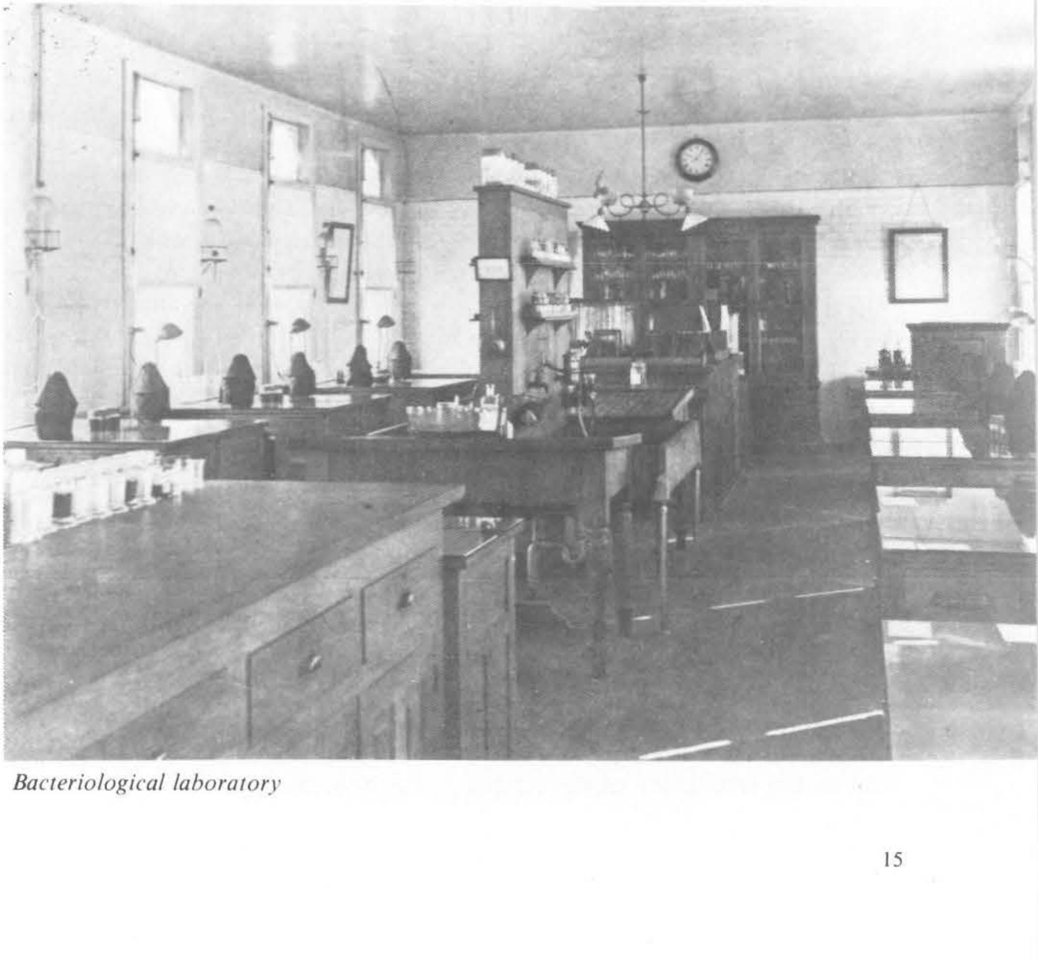
Three years later, all remaining buildings were ready for occupancy including the quarters for sick officers, corpsmen's quarters, nurses' quarters, contagious disease hospital, and housing for the commanding officer and other assigned medical officers (now Quarters AA, BB, CC).

The New Curriculum

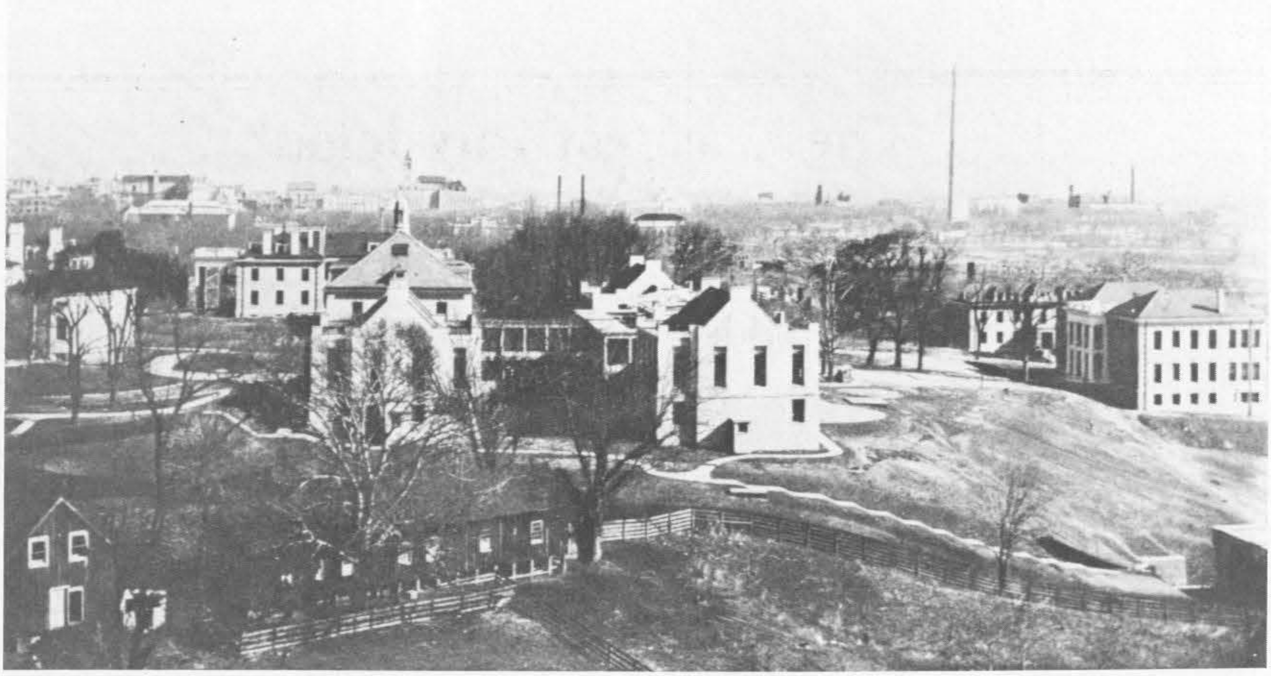
Observatory Hill had a new look. The Museum of Hygiene had been disestablished in 1905 and what had evolved in its place was a dual institution. Although the Naval Medical School and Washington Naval Hospital were housed in separate buildings, their relationship those early years was symbiotic. The hospital provided the School with instructors; the students gained clinical experience on the wards. Conversely, by 1910, almost all the School instructors were at least



Medical School chemical laboratory



Bacteriological laboratory



Observatory Hill looking east about 1910. The main hospital complex (center) is flanked by the Medical School library rotunda (left) and the contagious disease hospital (right). The stable appears in the foreground.

partially occupied with duty at the hospital.

That same year saw an expansion of the School's training program. Classes were instituted for hospital corpsmen, stewards, and nurses. But the addition of these new programs belied the fact that the School was being adversely affected by events beyond its control. In 1914 the United States responded to the revolution in Mexico with the occupation of Veracruz by the Marines. This event emptied the Naval Medical School of students. The regular winter term ended prematurely so those in attendance could be available for duty with the expeditionary force.

By 1917 the problem of maintaining a regular faculty had become critical. Because of other commitments, members of the teaching staff had little time to devote to teaching. The Surgeon General complained that "unlike the usual college instructors, [they] can give but a portion of their time to this work. They are on duty at the Naval Hospital, at the Naval Dispensary, at St. Elizabeth's Hospital, and in the laboratory of the school. They serve as members of examining boards and are constantly burdened with varied additional duties."(*6*)

The number of students trained at the facility during those early years was never great. From September 1906 to the close of 1916 only 235 students graduated.(*7*) However, even with the lull caused by the Latin American interventions and the loss of faculty, 1917 was a banner year; 175 student officers received instruction, a number that nearly equaled the entire previous attendance.(*8*)

Within a year the student population and admissions to the hospital would swell perceptibly. American entry into World War I would see to that. —JKH

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(To be continued in the March-April issue)

"The Greatest Physician"

On the BUMED grounds, shaded by a grove of oaks and a lone Norway maple, stands a bronze likeness of Benjamin Rush—physician, patriot, teacher, signer of the Declaration of Independence, Surgeon General of the Middle Department of the Continental Army, and humanitarian. Why the statue was created and how it found its permanent home is a fascinating story.

In the 1890's the War Department erected a statue on the grounds of the Army Medical Museum in Washington, DC, to the memory of Dr. Samuel D. Gross, a pioneer of modern surgical technique. There were those who felt strongly that if ever there was a representative American physician it was Benjamin Rush; he too, they argued, should have a suitable memorial in the Nation's capital.

COMO Albert L. Gihon, Medical Director, USN, spearheaded the drive to procure a statue of what he called "The greatest physician this country has ever produced . . ."* In a letter to the Secretary of the Navy, Gihon, as Chairman of the newly created Rush Monument Committee, justified a home for the statue: ". . . I trust you will find in Dr. Rush's pronounced advocacy of Hygiene as of fundamental importance in Medicine at a time when little consideration was given to it, sufficient reason for assigning a site to his statue at the approach to the great [Naval] Museum of Hygiene . . ."**

Secretary of the Navy Herbert approved the recommendation but reserved the right of his successor to choose the statue's final resting place.

Dr. Gihon died in 1901 and the Rush Monument Committee chose a civilian, Dr. James C. Wilson of Philadelphia, to carry on the necessary fundraising and procurement.

The American Medical Association, interested in the project from the start, was well represented on the Committee. Through that organization's efforts, individual AMA members contributed $15,000. No Federal money was ever appropriated. The Committee awarded the commission for the statue's design to Roland Hinton Perry, a sculptor of some note.† Architect Louis R. Metcalf designed the pedestal. The statue was cast in the foundry of the Henry-Bonnard Bronze Company of New York.

On 13 Jan 1904 a special commission headed by Surgeon General of the Navy Presley M. Rixey selected the final site in the general vicinity chosen by Albert Gihon.

The larger-than-life statue stood on a limestone pedestal set upon an octagonal granite base. Four panels featured the following legends: Front—"Benjamin Rush, Physician and Philanthropist, 1745, 1813;" Left—"Signer of the Declaration of Independence;" Right—"Studium sine calamo somnium;"†† and Rear—"The first American Alienist [psychiatrist]." On the base in front, cut into the stone, were the words "Erected by the American Medical Association, 1904."

On the bright, warm Saturday afternoon of 11 June 1904, the statue was unveiled and dedicated in the presence of 500 invited guests. Following musical entertainment by the Marine Corps Band, Dr. Wilson, Chairman of the Rush Monument Committee, eulogized Rush. President Theodore Roosevelt then accepted the monument as a gift from the medical profession to the Nation.

For over 60 years the Rush statue stood some 30 to 40 feet north of its present location. In the late 1960's the flagpole and statue traded places, and Benjamin Rush, who once greeted visitors who ascended a flight of stairs from E Street, now faces the front door of Building Two.

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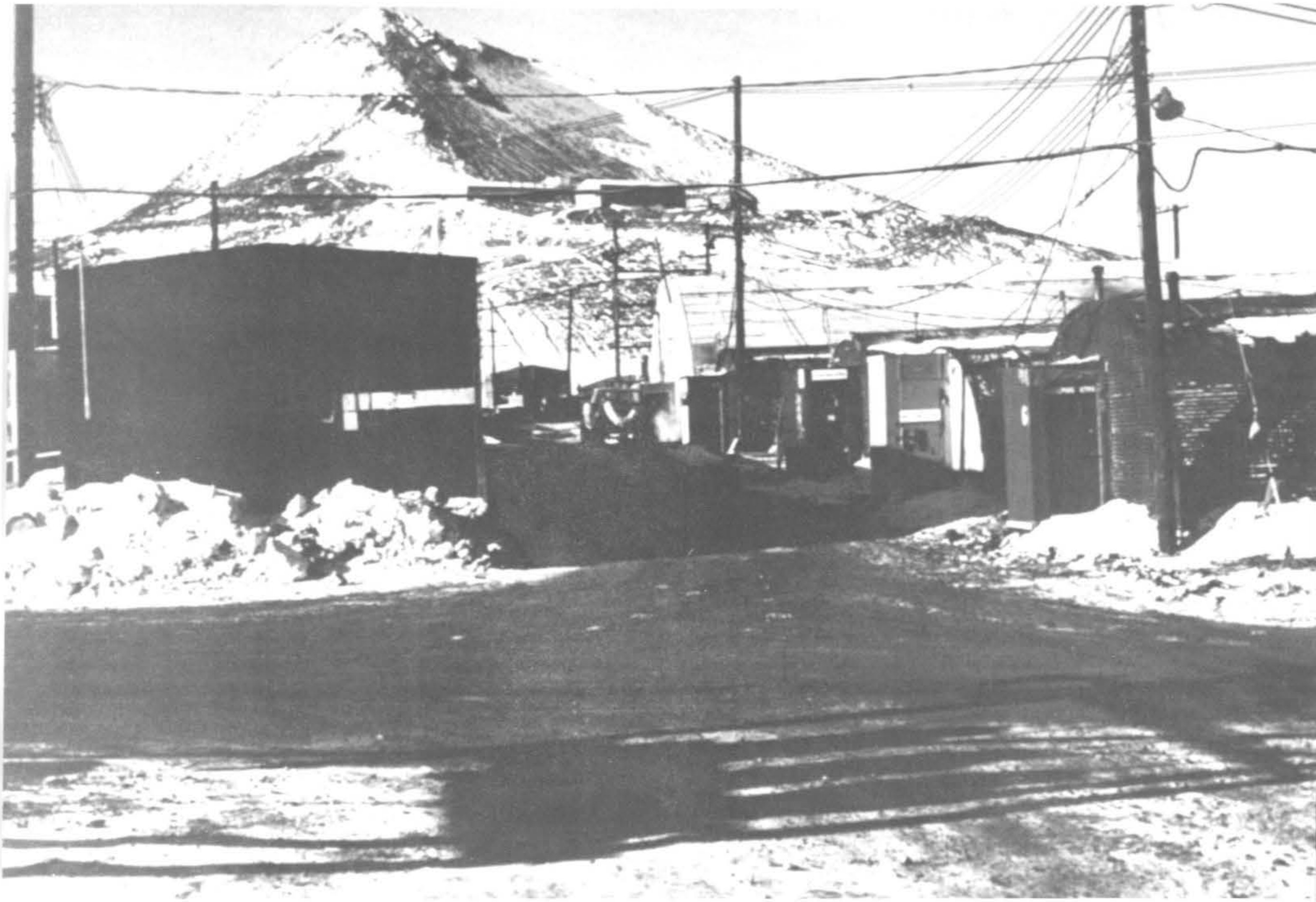
*Gihon AL: Letter to Hilary A. Herbert, Secretary of the Navy, 17 April 1896.
**Ibid.

†Perry's other work included the Fountain of Neptune and a series of bas-reliefs in the Library of Congress.

††This has been translated several ways: "Study without discipline is a dream," "Study without a pen is dreaming," and "Study of dreams without rod." The latter may allude to Rush's position on the humane treatment of the mentally ill.

Photos by CDR W.J. Weiner, MSC



Observation Hill looms over "downtown" McMurdo Station.

Assignment on Ice

The Navy's recruiting slogan guarantees more than a job; it promises an adventure. And an adventure it is for a small number of naval personnel and civilian scientists who live and work on the ice of the world's only frozen continent, Antarctica. One can live in the hostile environment but survival requires planning, logistical, and medical support. The Navy plays a key role in that effort by psychologically screening all applicants and debriefing those who winter over. The goal is to gather information that will benefit the Navy's Operation Deep Freeze.

CDR William J. Weiner, MSC, USN, a clinical psychologist assigned to the Health Promotion Division, MEDCOM-34, Naval Medical Command, Washington, DC, recently visited Antarctica to assess the experiences of these courageous personnel. U.S. Navy Medicine *spoke with him about his experience.*

USNM: What is the role of your division at the Naval Medical Command?
CDR Weiner: The division, under CAPT Noel Howard, MC, plans and develops all mental health programs

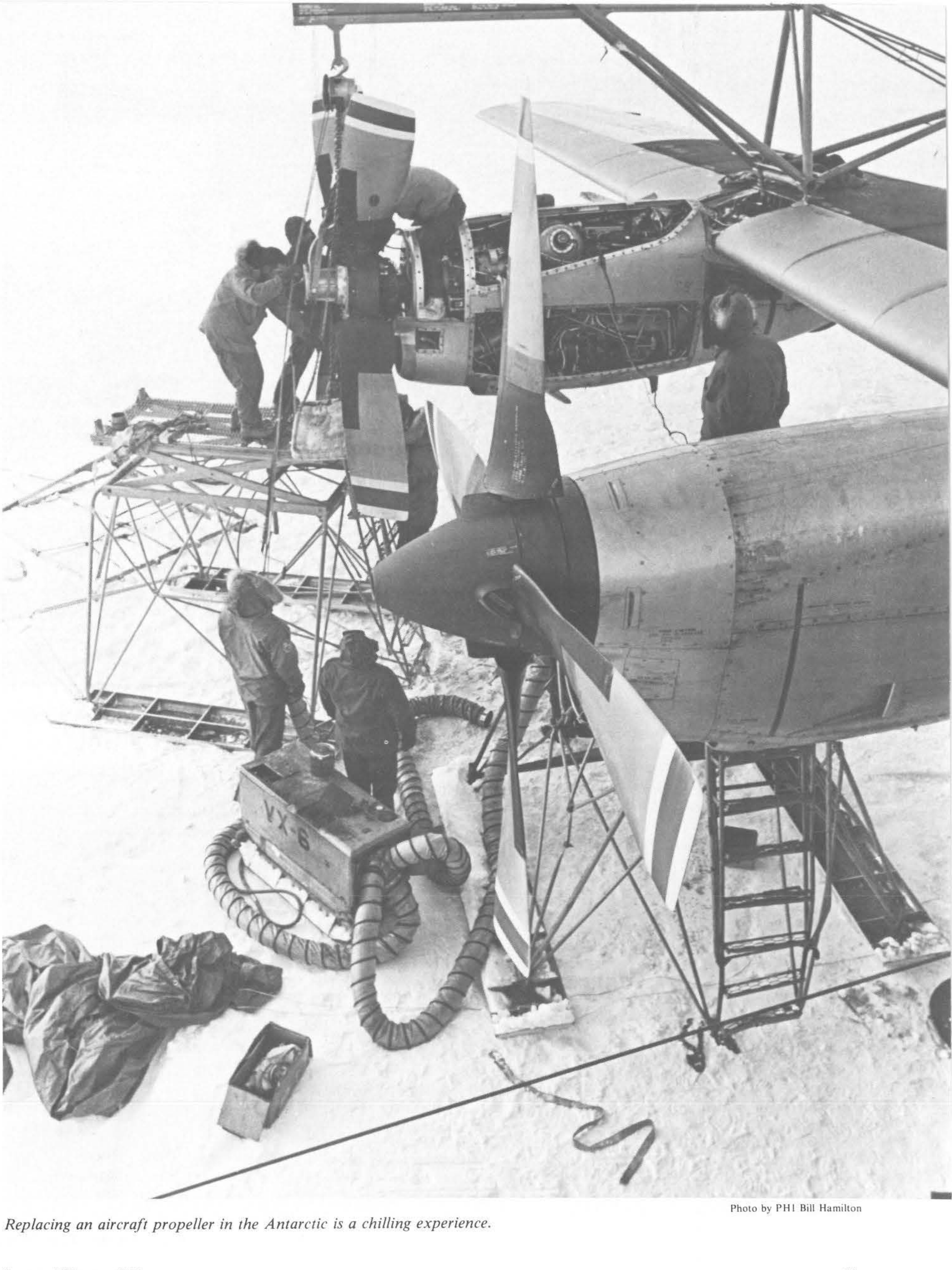


Photo by PH1 Bill Hamilton

Replacing an aircraft propeller in the Antarctic is a chilling experience.

Link with outside: A ski-equipped LC-130 Hercules arrives at the South Pole with supplies and personnel.

It's a long, cold hike from plane . . .

. . . to shelter.

for the Navy which includes direct and indirect clinical services. By direct, I mean program development for Psychiatry Services throughout the Medical Department and indirect services such as Operation Deep Freeze.

How does your division interact with Antarctica?

We provide part-time input in the form of a screening service to Naval Support Force, Antarctica, for those who winter over.

Do you provide this screening service just for military personnel and what do you mean by wintering over?

We screen both military personnel and civilian scientists and conduct psychological testing and interviews to determine their capacity to endure at Antarctica. Wintering over is the term applied to individuals that stay on the ice through the winter. First, we screen the Navy personnel, which is the Naval Support Force, Antarctica, based in Port Hueneme, CA. The civilians are scientists who work for projects through the National Science Foundation (NSF) and support personnel hired through Antarctica Services, a division of ITT (International Telephone and Telegraph), in Paramus, NJ.

Are you involved with just American scientists or is your responsibility international in scope?

Most are American scientists hired through Antarctica Services or through universities that hold grants from NSF. We don't screen exchange scientists from foreign nations who go to the American station. They go through a similar process in their respective nations.

What does the Navy call its Antarctica program?

It's called Operation Deep Freeze and NSF labels theirs the United States Antarctic Research Program.

What is the size of the Navy contingent in Antarctica?

During the summer at McMurdo Station, which is the largest United

At South Pole Station a "wonder arch" (left) lies half buried beneath ice and snow. This structure gives protection from the elements to many of the Station's facilities such as the biomedical building (below).

States base, there are 800 to 1,000 people who refurbish facilities and resupply consumables. During the winter there are about 65 military and 15 civilians.

What was the purpose of your visit?

To look at the environment at McMurdo Station and debrief those personnel who had wintered over at the South Pole. Each year, usually one psychologist and one psychiatrist go down to debrief the outlying stations.

What is the reason for the annual debriefing?

One is to gain information to improve our screening techniques. The other reason is to make sure everyone that has the experience is still in pretty good shape.

What do you do if you encounter a problem with an individual in the debriefing interview?

If there's any difficulty, we direct them to professional treatment for emotional problems.

What key elements in the environment are helpful in your evaluation?

We need to understand the cold and lack of stimulation on human health and behavior. The seasons there are the opposite of those here with months of continuous sunshine and alternately complete darkness which can affect personnel. We monitor how one occupies time and operates in the unique workspaces. Things can become more complicated there because of space restrictions and the antarctic temperatures.

Are you able to make a fair assessment in just the short time you're there?

To fully understand the nature of the experience, one should winter over. We just can't learn everything by listening to personal accounts. I spent a month there and saw the continuous daylight and activities that occurred which gave me a glimpse of what the support personnel experience. I tried to imagine the same work under total darkness and colder temperatures.

What are the temperatures?

During the summer at McMurdo Station, the temperature ranges between -10° and 20° F. At the South Pole Station, which is 800 miles inland, the thermometer registers -20° to -40° F, sometimes colder. It's quite possible to accomplish routine tasks outside. This changes during the winter months when McMurdo Station gets around -50° F with a windchill factor of -80° F. At the South Pole one can expect temperatures around -100° F with a windchill factor that makes it much colder.

Where does the stringent psychological screening take place prior to assignment?

For Navy personnel there's a major screening effort every May in Port Hueneme. We also interview military personnel at San Diego, Bethesda, Long Beach, Oakland, and Great Lakes. We screen the civilians at the same primary medical facilities with secondary support from military installations worldwide.

Who does the screening?

The requirement is that a psychologist and a psychiatrist see each individual on an independent basis and submit a consensus report.

What did you feel as you stepped off the plane on the ice?

I was a bit anxious about it. When I got off the plane the temperature was about -22° F and the wind was about 30 knots. I looked around at all the ice, beauty, and whiteness. I saw Mt. Erebus, an active volcano, in the background and was exhilarated. My anticipations exceeded the immediate threat that existed.

What are the military personnel at McMurdo Station like?

It's a friendly group. Some younger people might have trouble adjusting but I think things improve as the season progresses. The escapes from the environment are less. One can't get into the car and drive downtown.

Describe a typical day at McMurdo Station.

The average workday is not terribly different except they work on Saturday. The month I was there the Sun never set, so regular working hours is a good idea. Work provides a vehicle for release of excess energy and tension. It would be an easy place to lose one's orientation if things weren't regular. The mess hall operates on regular hours and afterward it's used for recreation. Most work is scientific and life support research. After hours, there are clubs, a library, movies, and a small weight room. The quarters have shutters which permit sleep at regular hours. And, there are religious services.

Describe the medical staff and facilities.

Sickbay is a single, butler-type, prefabricated, corrugated, metal building not much different than any other there. The senior medical officer is CDR James E. Baggett, MC, who gets physician support from the aviation squadron, VXE-6, in the form of a flight surgeon and several corpsmen. There are also a general medical officer and hospital corpsman who stay all year.

Does the support you describe seem adequate and what about supplies?

Dr. Baggett insures the medical facilities have adequate supplies at all stations. The Navy also provides Siple and Palmer Stations with chief hospital corpsmen, both of whom winter over. A civilian physician serves the South Pole Station. These isolated medical personnel order supplies through McMurdo Station, which also provides medical evacuation capability and professional support in the form of consultation by radio.

How would a medical evacuation be handled during the months of darkness?

Only in most severe circumstances would that even be considered because of such extreme cold and high risk to aircraft due to strong winds.

What are some common medical problems?

Usually industrial accidents such as broken limbs, contusions, lacerations, and bruises. One of the worst difficulties is a dental emergency. In the extreme cold, fillings shrink and fall out and dental plates crack.

Is exposure to cold a major concern?

There is occasional frostbite and maybe hypothermia. Personnel wear proper clothing and obey the rules for the most part and I think that's a credit to our screening process.

Do emotional problems such as cabin fever manifest themselves in this environment?

Yes, there is an equivalency to cabin fever. Because of the isolated environment and reduced stimulation, thinking slows down. There's not as much to see or hear and, therefore, some show a tendency toward depression and irascibility. People seem to be physically and psychologically driven inward.

Do personnel experience insomnia?

There used to be a phenomenon called "big eye," which is a form of insomnia. In recent years people seem to be able to regulate themselves by some kind of discipline to make a night when the Sun's up and make a day when it's dark out. I didn't find insomnia to be a problem.

What effect do the elements have on physical well-being?

The Russians believe the weather and the magnetic forces have a definite effect on people. Extreme cold and constant wind combine to create more of a health risk than either as a separate element. What's nice is there seems to be no permanent effect from the phenomena personnel experience in Antarctica.

Is there an exercise program?

Yes, though it's done on a voluntary basis. Some jog indoors during the winter and outdoors in the summer. Others use the weight room. People that I felt did well were those that had a regular eating, working, sleeping, and exercise schedule. This helped them keep their orientation and sense of purpose.

What is done to increase stimulation?

There's a small library at McMurdo and a larger one at the South Pole. Movies are also shown and McMurdo has closed-circuit television. The South Pole has videocassettes. It would probably be wise to increase the number of motion pictures and recreational facilities.

Why do you say that?

There are several schools of thought. One is that Antarctica is a place for self-motivators. Those who aren't, complain about a seeming lack of diversion and recreation. Others claim the place is becoming altogether too civilized. These people believe the horizon should be there for the explorer, without frills.

Let's go back to the nature of your visit. How did you get from McMurdo to the South Pole and how was it different?

My essential mission was to debrief the South Pole Station. I flew from McMurdo on a ski-equipped LC-130 Hercules over the Trans-Antarctic Mountains and landed on the polar ice cap. I spent a week talking to those who wintered over. The station has underground tunnels dug in the ice like in McMurdo and most of the buildings are covered by a metal geodesic dome. There are several quonset huts outside the dome. When I landed, it was -40° F with winds at about 30 knots so the windchill factor was -86° F. The altitude is in excess of 9,000 feet. Life there is much more spartan.

What was your overall impression of the Navy operations?

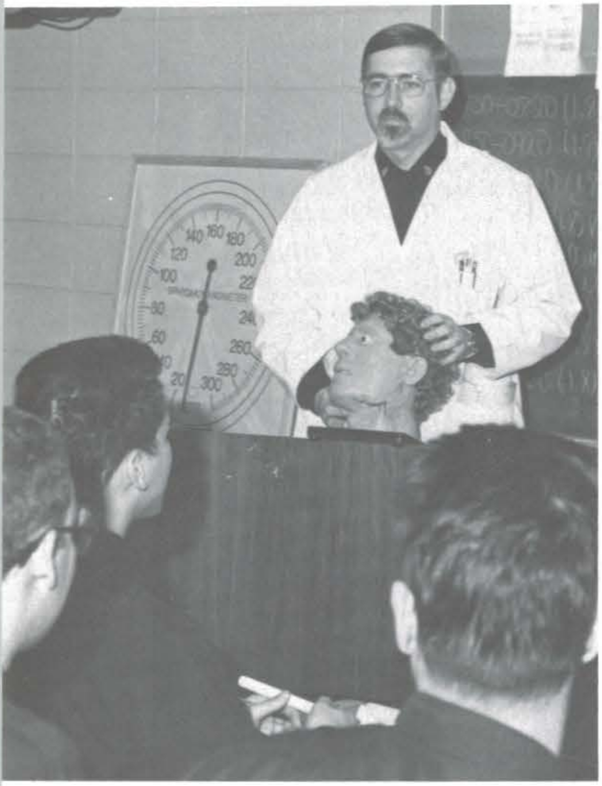
I took the closest look at the medical operations and developed a healthy respect for the competence and attitude of the corpsmen. They really pull together. The Seabees have a tough job since they do all their construction in the cold. I visited the firehouse, water distillation plant, communications, supply section, administration, and sickbay. I found a high degree of pride and professionalism.

One hears that those who have been to Antarctica always return. Is that true and are you anxious to go back?

It's a unique setting. There are incredibly beautiful sights that attract scientists and explorers. There's a mystique since so much of the frozen continent lies uninhabited. I wouldn't turn down an opportunity to go back. I don't know if I'd winter over, but I certainly admire people who do.
—HMCM Curtis A. Crocker

Photo by HM1 Dave Diamond

CDR Weiner



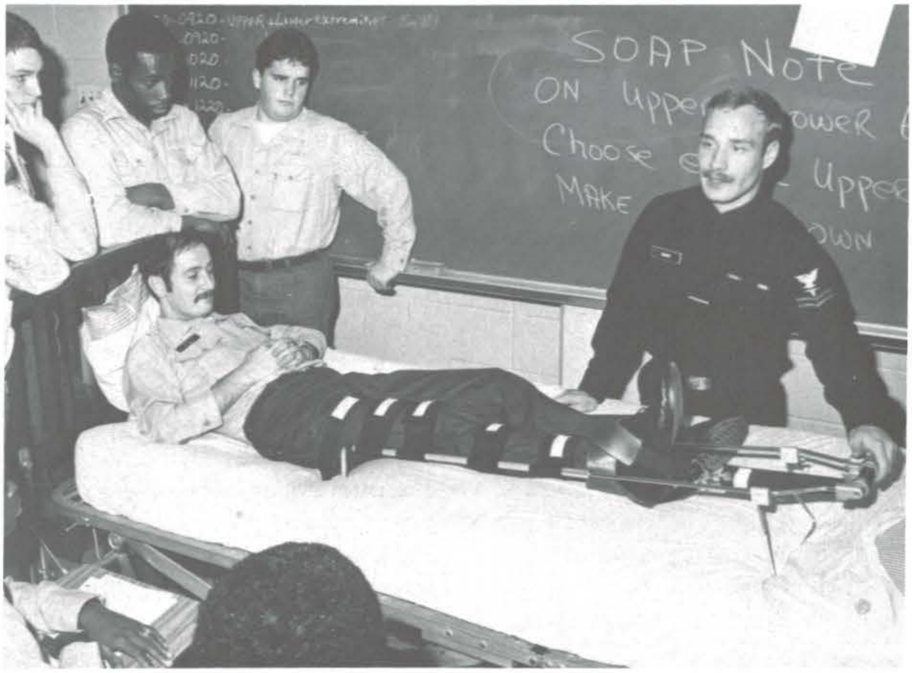
Using "Mr. Hurt Manikin," HMC John A. Juellich instructs a class on head and neck injuries.

A New Approach to Corpsman Training

CDR Susanne R. Armstrong, NC, USN (Ret.)
Alexander M. Gottesman, Ed.D.
Lenore E. Saltman, Ph.D.

The popular TV show M*A*S*H, with its familiar cry "Corpsman, Corpsman," may lead the public to believe that all corpsmen are in the field running beside stretchers holding IV's 24 hours a day. Contingency requirements are always the foremost priority for training and assignment, but Navy hospital corpsmen also provide a wide range of care at medical centers and clinics, on ships, and with the Fleet Marine Force. Their expertise is needed in every aspect of medical care—prevention, treatment, diagnosis, and administrative support—and their range of jobs is as broad as health care itself.

All technical training for enlisted personnel in the Medical Department begins with Hospital Corps School (HCS) either in Great Lakes or San Diego. Heretofore, corpsmen have been trained in a heavily classroom-oriented program. However, it became evident over time that this approach was not as effective as hoped. Supervisors reported that many beginning corpsmen were able to perform required basic skills only after participating in additional training at receiving commands. In surveys conducted in 1979 and 1980 the few



HM2 Tom Denny demonstrates the Hare-Traction splint.

When this article was written, CDR Armstrong was Chief, Instructional Programs Division, Health Sciences Education and Training Command (HSETC), Bethesda, MD 20814. Dr. Gottesman is Head, Formal Schools Curriculum Branch, and Dr. Saltman is Supervisory Education Specialist, Operational Medicine Division at the same activity.

areas in which corpsmen performed well (before inservice training) were those where drill and practice were incorporated in the corps school curriculum. Conversely, content areas covered primarily in a lecture mode were not well retained. After a thorough analysis of available data it became clear that the curriculum had to be revised.

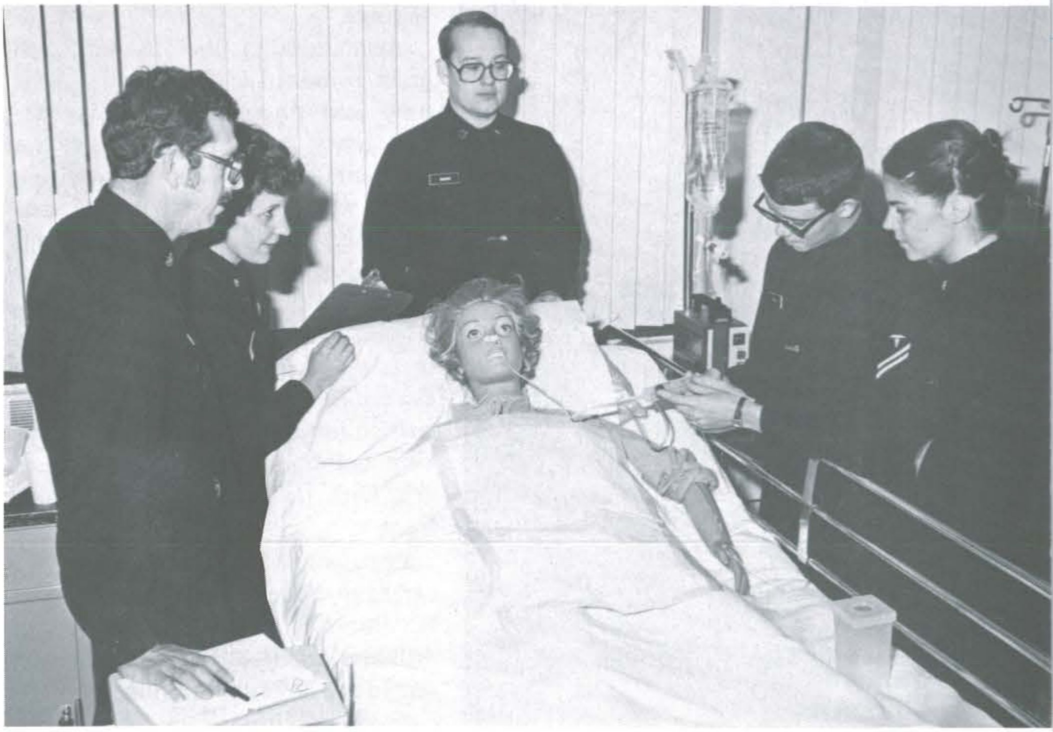
Through a needs assessment conducted in 1979 and 1980, 193 essential tasks were identified and subsequently clustered into 63 skill areas. These became the bases for a major curriculum revision calling for more practice and performance in the basic hospital corpsman curriculum. In order to insure increased competence on the job, the formal school training time was extended from 10 to 12 weeks. The additional 2 weeks allow for dramatic increases in hands-on experience in the simulated laboratories and the actual clinical settings.

It would have been impossible to accomplish this change without additional instructors and funds. Approval of the revised program and authorization of funds and manpower by the Bureau of Medicine and Surgery (BUMED) in May 1982 allowed a four-person development team at Great Lakes' HCS to begin writing the curriculum. But before BUMED gave the "go" signal, a Task Force from the Naval Health Sciences Education and Training Command (HSETC), HCS Great Lakes, and the Naval School of Health Sciences, San Diego, worked together to conceptualize a new approach to the Hospital Corps "A" School curriculum.

From the beginning there were two major thrusts: (1) to integrate the academic subject matter into a cohesive training program geared to the tasks corpsmen are expected to perform,

Photos by Robert Johnson

Students practice applying the Thomas Half-Ring splint . . .



. . . learn to irrigate a nasogastric tube . . .

. . . use the Neil-Robertson stretcher . . .

. . . and the short spine board.

and (2) to design a curriculum with large blocks of time for practice of skills in simulated and clinical settings.

Academically, the 10-week program consisted of five sections: anatomy and physiology, patient care, emergency care, drug therapy, and environmental health. In addition, there was separate self-paced programmed instruction in basic and medical mathematics knowledge and skills. The Task Force examined the 63 skill clusters, the job task inventory, the corps school goals, and the evaluative data, and then revised the curriculum into two functional areas: Unit I, Prehospital Emergency Care, and Unit II, Basic Hospital Patient Care.

Prehospital Emergency Care is a carefully sequenced unit consisting of 121 hours of lecture and 55 hours of drill and practice. The content is presented in a hierarchical framework. As each topic is introduced, the previous topics are reviewed and integrated with the new topic in both the classroom and practice environment. For example, the student learns general communication and observation techniques. Then he learns the techniques and procedures for taking vital signs and conducting a primary and secondary assessment. Now the student incorporates the observation and communication skills into a head-to-toe assessment of the patient that includes taking vital signs, checking skin color and pupil reaction, and looking for body deformities and other signs. In another instance the student is taught to immobilize a fracture. As he approaches his victim, he first conducts a primary and secondary assessment. In addition, he may have to control bleeding, administer oxygen, perform CPR, or demonstrate any number of skills previously learned. As part of the integrated approach, each lesson includes appropriate anatomy and physiology. For example, the circulatory and respiratory systems are incorporated into the lectures on vital signs and CPR and reviewed prior to lectures on emergency care for patients with heart conditions. Knowledge and skills presented in lectures are meshed with simulated applications in laboratory settings. Here instructors work with students in small groups, usually a one-to-eight ratio. Using a variety of teaching strategies, e.g., demonstration, simulation, and role-playing, the students practice, practice, practice.

At the completion of Unit I, Prehospital Emergency Care, students are eligible to take the National Registry for Emergency Medical Technician written and practical examination. Students passing the examination will receive provisional registration as Emergency Medical Technicians. Although National Registry testing is not currently included in the 12-week program, it is planned for the near future.

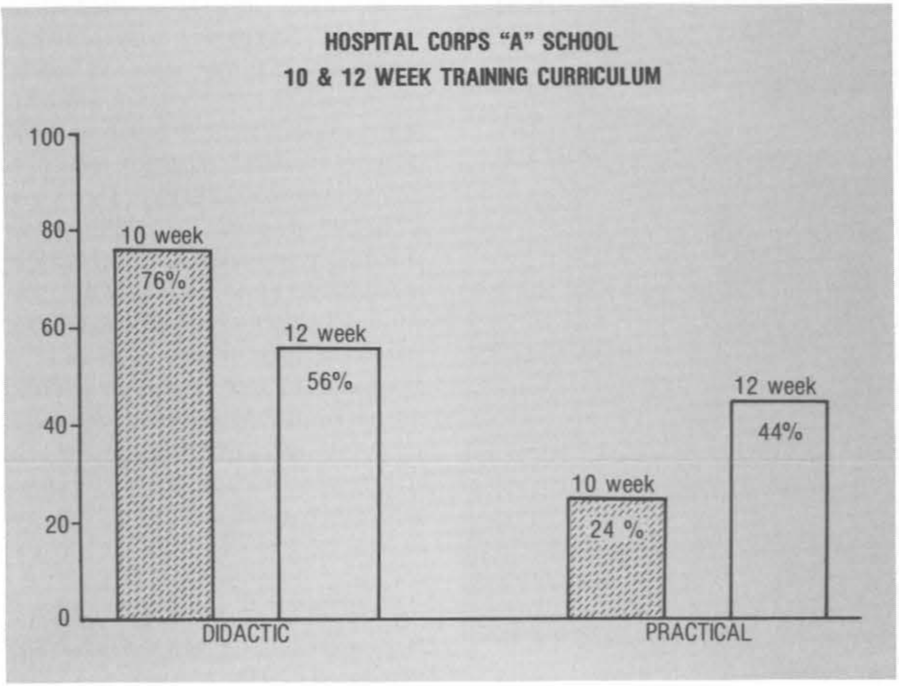
After the student completes Prehospital Emergency Care training, he begins Unit II, Basic Hospital Patient Care. The training strategy is identical; content in the classroom is correlated with drill and practice. Simulated practice totals 68 hours of the Basic Hospital Patient Care curriculum. Performance in the hospital clinical setting involves 60 hours, 40 of which take place during the last week of the program. These last 40 hours are full days of patient care during which the students handle representative assignments in all the basic tasks a hospital corpsman might perform in the patient care setting. Indeed, 60 percent of the 212-hour unit involves hands-on experience.

As with Prehospital Emergency Care, the tactic in Basic Hospital Patient Care is to build on skills previously learned, not to teach skills separately. One instructional strategy involves the use of scenario cards. Students are given individual cards delineating the condition of a patient (fellow student) on the ward (simulated). One card may instruct the student to bathe a patient with a full leg cast, then move him to a chair and then back to bed. The student must not only perform all these tasks but also carry out other activities, i.e., taking vital signs and recording and charting accurately. Another scenario describes a postoperative patient. The student must use basic observation techniques, take and record vital signs, monitor the IV, irrigate a nasogastric tube, and record the patient's intake and output. The student must also initiate the nursing notes and record and report appropriate observations. In all simulated ward situations, emphasis is placed not only on learning a new skill but also practicing a number of skills previously learned. The chart shows instructional percentages for the 10- and 12-week programs. Percentages for the separate curriculum units are not displayed.

Thus, if practice makes perfect, the 12-week-program graduates will be more conversant with the materials and equipment used in emergency and patient care, as well as more confident in their ability to perform the required tasks. It is anticipated that stronger skills and higher confidence levels will result in increased job satisfaction. This can lead to higher retention rates and greater success in advanced "C" School training.

The program is being piloted at HCS Great Lakes and will undergo internal and external evaluation to be conducted by HSETC. However, in spite of the increased experience in simulated situations, the revised curriculum lacks emphasis on adequate *real* patient contact. And, as familiar as the students will be with the required skills, the minimal patient contact can act as a deterrent to beginning competency. Recognizing that command orientations for the newly graduated corpsmen may or may not include a clinical component, HSETC, in collaboration with Naval Hospital (NH) Bethesda, has designed a 3-week follow-on training program for use at shore-based medical facilities receiving "A" School graduates. In order to determine the model's effectiveness, the program will be field-tested in 1983 at NRMC Charleston and NH Bethesda. During this period, new corpsmen at these two sites will experience intensive, supervised, structured practice in basic patient care skills in both inpatient and outpatient settings. As in the revised "A" School curriculum, observation and documentation tasks are integrated throughout. HSETC will work closely with these two commands to evaluate and revise this follow-on training during the field-testing period. At the end of 1983, the program will be disseminated to all medical facilities receiving graduates as a model for new corpsmen follow-on training.

Three years of research, analysis, planning, design, and development have gone into this program, with participation from personnel throughout the Navy. However, the effectiveness of a program on paper, in the classroom, or even in the clinic is ultimately determined by the performance of the trainees on the job. Therefore, during this pilot year, HSETC is soliciting formal and informal feedback from the field about the performance and confidence of graduates completing the 12-week revised HCS curriculum. Commands are encouraged to communicate their findings to HSETC. If the 12-week program at Great Lakes proves as successful as the developers anticipate, it will also be implemented in San Diego. ☐



Necrotizing Ulcerative Gingivitis

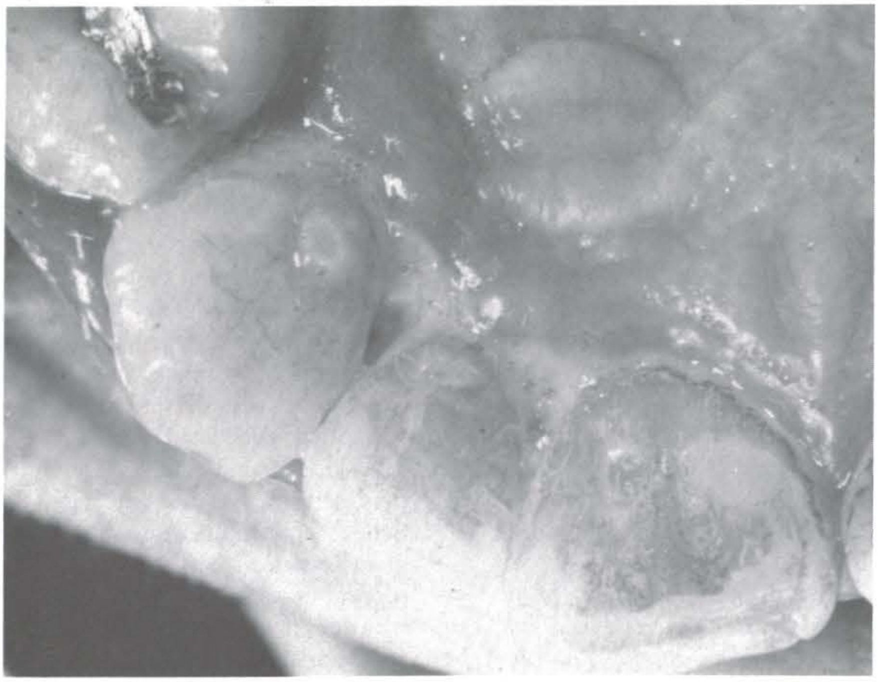


FIGURE 1. Necrotic, punched-out, interdental papillae

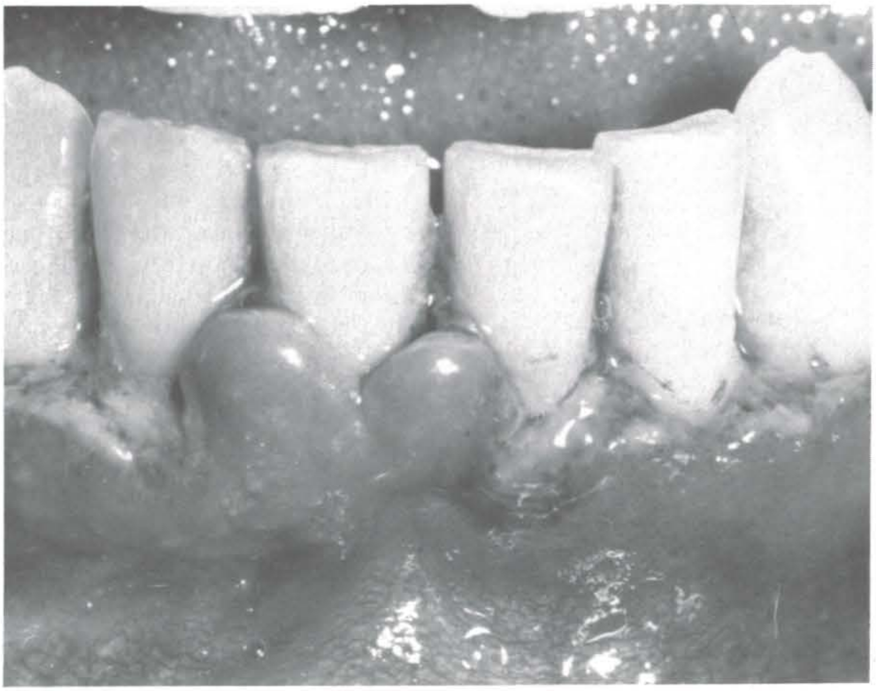


FIGURE 2. Advanced involvement of gingival tissues

CAPT D.R. Ahl, DC, USN

Necrotizing ulcerative gingivitis (NUG) is an acute gingival infection that may be seen in adolescents and young adults. Traditionally, NUG has been associated with the military, particularly the soldiers in the trenches during World War I. "Trench mouth," "Vincent's infection," and "Vincent's disease" are some of the terms used to describe this periodontal emergency. Although not a common clinical condition, NUG may appear in the young adult by itself or in conjunction with other disease entities involving the oral mucosa.

Diagnosis

Classical signs and symptoms of NUG include **ulceration of the tips of interdental papillae, bleeding,** sudden onset, pain, and foul odor (fetor oris).(*1*) **Necrotic, punched-out, interdental papillae** covered with a grayish-white pseudomembrane is the most characteristic feature of NUG (Figure 1). Also characteristic of the early stages is a tendency toward easy gingival bleeding, whether spontaneous, induced by gentle probing, or precipitated by tooth-brushing. Pain, although not a consistent symptom, may vary in intensity from mild to moderate to severe. Pain is easily elicited by probing the ulcerated crater areas. A recognizable odor to the breath may be characteristic, but not necessarily pathognomonic.The pa-

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tient may describe the taste in his mouth as "metallic." There may also be regional lymphadenopathy and low-grade fever.

The most frequent areas of involvement appear to be near incisors and third-molar flaps. A chief complaint of sore wisdom teeth quite often leads to a diagnosis of NUG after a thorough history has been taken, a clinical evaluation has been made, and after pericoronitis has been ruled out by differential diagnosis.

Advanced or recurrent involvement may be evidenced by extensive necrosis, proliferation of tissue with altered gingival architecture, deep soft-tissue craters, and detachment of tissue resembling a flap (Figures 2 and 3). A dramatic loss of interdental septal tissues may be seen in incisors or teeth with close root proximity.

Differential Diagnosis. Necrotizing ulcerative gingivitis is usually limited to the gingival tissues. However, other locations within the oral mucosa can be involved. Systemic debilitating diseases, viral influences, or dermatologic diseases may be manifested intraorally in conjunction with NUG (Figure 4). The clinician should always include a comprehensive differential diagnosis when first evaluating the NUG patient for treatment. In addition, clinical response during therapy should be monitored to determine what medical consultations, if any, are appropriate.

Clinical entities that produce lesions similar to those of NUG or that may occur in conjunction with NUG include the following:

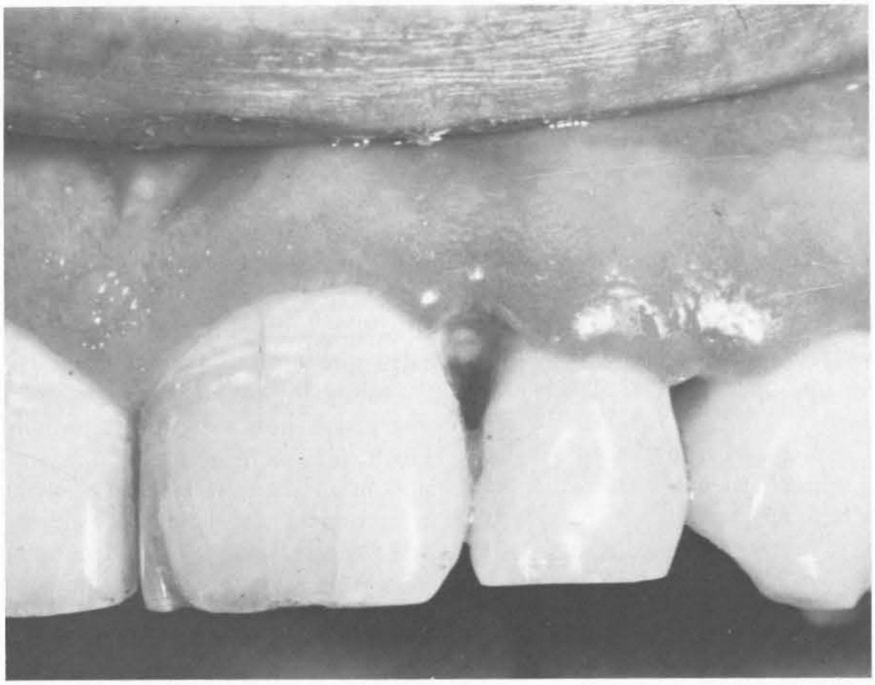

FIGURE 3. Necrotizing ulcerative gingivitis with deep soft-tissue crater

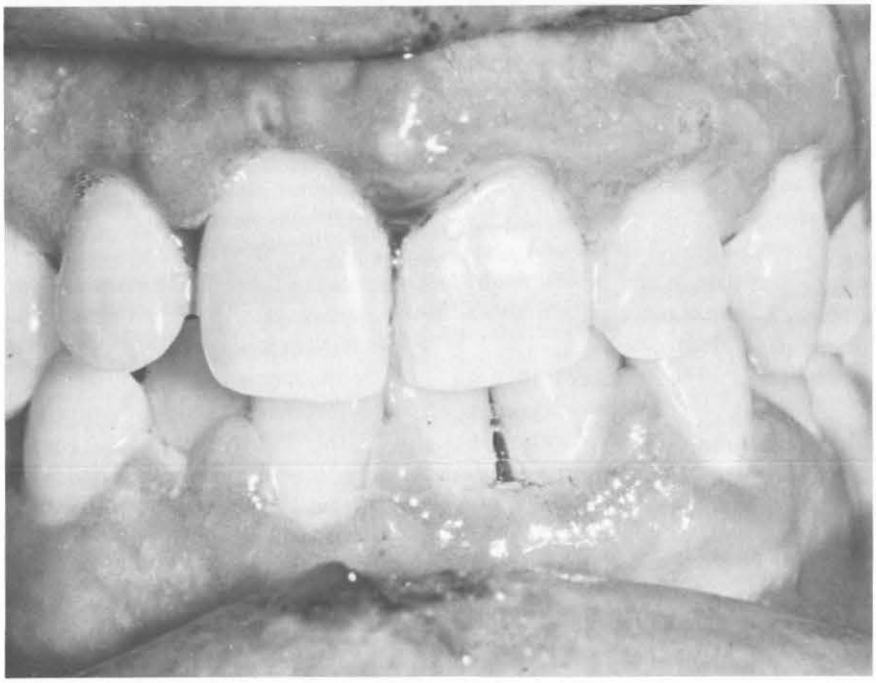

FIGURE 4. Viral stomatitis—differential diagnosis

- Acute gingivitis
- Pericoronitis
- Viral stomatitis
- Aphthous stomatitis (canker sores)
- Desquamative gingivitis
- Infectious mononucleosis
- Oral manifestations of dermatologic diseases such as lichen planus or benign mucous membrane pemphigoid
- Hematologic conditions such as acute leukemia, aplastic anemia, and agranulocytosis

Awareness of signs and symptoms of the preceding clinical entities and evaluation of response to therapy are essential in successful management of the NUG patient. If there has not been a dramatic response to treatment within 72 hours, the clinician should consider additional laboratory tests and appropriate medical consultations.

Etiology. Microorganisms, including spirochetes, *Fusobacterium,* and *Bacteroides melaninogenicus,* have been increasingly associated with cases of NUG. Clinical response to antibiotics tends to support the role of these microorganisms as causative factors. (*2-4*)

Other predisposing factors should not be ignored. Calculus, overhanding margins of restorations, gingival flaps over molar teeth, food impaction, malposed teeth, and improper tooth contacts can interfere with effective plaque removal and thus enhance the accumulation of microorganisms.

Fatigue, smoking, general debilitation, and emotional stress may play a significant role in the development and clinical appearance of the acute phase of NUG.(*5,6*)

Each factor should be considered carefully for the influence it may exert on a particular patient, and the therapy should take everything significant into account.

Treatment

Management of NUG should be directed toward controlling the acute bacterial phase, developing improved patient effectiveness in plaque control, and eliminating or managing predisposing factors, both local and systemic.(*7*)

Early, aggressive, clinical instrumentation, patient involvement in plaque control, and supportive treatment will produce a rapid resolution of the acute phase. Occasionally, patients experience a decrease in symptoms as a result of the first treatment visit. Antibiotics are not a substitute for vigorous instrumentation, but they should be considered if there are systemic complicating factors. Patients should be seen for treatment three to four times a week.

During the initial visit, ultrasonic instrumentation is used to remove as much calculus, plaque, and debris as possible, and an effort should be made to accomplish debridement efficiently and gently. Irrigation from the ultrasonic scalers and instrumentation will usually remove the pseudomembrane and produce bleeding interdental sites. Institution of effective oral hygiene, although uncomfortable, is important at this initial visit to produce rapid resolution. The use of a brush or other interdental hygiene aids should be oriented toward cleansing the interdental craters. Dental floss should be used to cleanse the proximal tooth surfaces, but it may be less effective in physical cleansing of the soft-tissue craters.

Subsequent visits should occur every 1-2 days with repeated instrumentation of interdental or affected sites, reinforcement of plàque control, and monitoring of results. Symptoms should decrease with each visit. Bleeding should be almost eliminated, and clinical health should be apparent. Gradual elimination of interdental craters may ensue, or corrective gingivoplasty may be indicated to facilitate plaque control.

Supportive therapy and nutritional supplements may be necessary for the patient presenting with constitutional symptoms. Antibiotic therapy should be considered for the patient with systemic involvement. If signs and symptoms are not resolved within 72 hours, the other clinical entities should be considered.

Conclusion

Necrotizing ulcerative gingivitis is an acute gingival infection with the classical signs of interdental ulceration, the formation of pseudomembrane, and a tendency toward easy gingival bleeding. Early and vigorous clinical instrumentation combined with effective plaque control will produce rapid resolution of the signs and symptoms.

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Effective Use of Vasodilators in Pulmonary Hypertension Secondary to Recurrent Thromboembolic Disease

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Pulmonary hypertension may be idiopathic (primary) or secondary to lung diseases such as recurrent pulmonary emboli. In pulmonary hypertension caused by pulmonary emboli, therapy is initially aimed at anticoagulation and eliminating the cause of the emboli. However, once pulmonary hypertension and right heart failure become evident, therapeutic alternatives are lacking.(*1*) Several reports have shown that patients with primary pulmonary hypertension have a favorable hemodynamic response to vasodilators.(*2-9*) However, there are few reports in the literature of vasodilator-induced improvements in pulmonary hypertension resulting from recurrent thromboembolism. Dantzker et al.(*10*) reported beneficial responses in five patients while others(*11,12*) reported deleterious effects. This paper details beneficial hemodynamic responses to isoproterenol, phentolamine, nitroglycerin, and hydralazine in a 78-year-old man with pulmonary hypertension and cor pulmonale secondary to recurrent pulmonary thromboembolic disease.

Patient Report

A 78-year-old man was admitted to the hospital for evaluation of right heart failure. The patient had noticed the insidious onset of dyspnea, lower leg edema, and weight gain over the 5 years preceding admission. The dyspnea had worsened over the 2 months before admission to the point that he was dyspneic walking across a room. The patient was a nonsmoker and had no previous history of cardiac or pulmonary disease. His past history was significant for venogram-proven thrombophlebitis in 1978 and 1979. A lung scan performed in 1979 showed "high probability" defects consistent with pulmonary emboli. He was treated for 6 months with warfarin sodium. The remainder of his past history was noncontributory. On physical examination, the patient was a thin, elderly, white male, with dyspnea at rest. Blood pressure was 140/76 torr, respiratory rate 24/min, heart rate 100/min, and temperature 37°C. Physical examination was remarkable for jugular venous distention with a positive Kussmaul's sign, hepatojugular reflux, accentuated P_2, a right ventricular diastolic gallop, a high-pitched blowing murmur of pulmonic insufficiency, and 3+pitting pretibial edema. Room air arterial blood gas determinations showed a pH of 7.5, PO_2 46 torr, and PCO_2 33 torr. Hemogram, coagulation profile, and urinanalysis were normal. Chest roentgenogram showed an enlarged right ventricle and a dilated pulmonary artery. On electrocardiogram, right axis deviation and right ventricular hypertrophy were noted. Pulmonary function testing was normal except for a diffusion capacity (DLCO) of only 65 percent of predicted. M-mode echocardiogram showed an enlarged right ventricle (40 mm) with paradoxical septal motion; 2D echo-cardiogram demonstrated an enlarged right ventricle (36 mm), thickened intraventricular septum, and normal left ventricular diameters. A "gated" blood pool cardiac scan showed normal left ventricular function. A perfusion lung scan revealed multiple

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TABLE 1. Results of Vasodilators in a Patient With Pulmonary Hypertension Secondary to Recurrent Pulmonary Emboli

Drug	AVO_2 Diff	BP (sys/dia/mean) (mm Hg)	PA (sys/dia/mean) (mm Hg)	PCWP (mm Hg)	CVP (mm Hg)	CO (l/min)	PVR (dynes-sec-cm^{-5})	SVR (dynes-sec-cm^{-5})
Baseline	6.4	148/65/93	100/23/50	13	4	3.9	746	1743
Isoproterenol	4.4	139/52/80	110/22/50	12	2	7.2	422	866
Baseline	6.0	151/64/91	100/22/49	12	2	3.69	802	1929
Nitroglycerin	6.2	123/61/81	82/22/38	12	1	4.4	473	1472
Baseline	6.1	148/65/94	100/22/50	10	6	4.2	762	1676
Phentolamine	4.3	152/65/90	102/20/47	10	4	5.0	592	1376
Baseline	5.1	150/63/89	100/20/48	10	2	4.6	661	1513
Hydralazine	4.0	120/47/71	100/19/46	9	3	6.2	477	877

subsegmental defects (new from prior lung scan), compatible with multiple pulmonary emboli. With right heart catheterization, an elevated pulmonary artery pressure (PA) of 100/20 mm Hg (mean 46 mm Hg), a pulmonary capillary wedge pressure (PCWP) of 12 mm Hg, a cardiac output of 3 l/min, and a pulmonary vascular resistance (PVR) of 904 dynes-sec-cm^{-5} were noted, without evidence of a right-to-left shunt (by oximetry). During catheterization the patient was given a trial of oxygen therapy but had no change in pulmonary pressures or resistances. The patient was treated with 2 l/min nasal oxygen and warfarin sodium anticoagulation. Despite 6 weeks of this therapy, symptoms and physical findings persisted and, therefore, he was admitted for a trial of vasodilators.

Methods

After signing an informed consent, a thermodilution Swan-Ganz catheter and a radial arterial catheter were inserted. Twenty minutes after the catheters were inserted, baseline determinations of mean pulmonary artery pressure (MPA), PCWP, central venous pressure (CVP), mean arterial blood pressure (AP), cardiac output (CO) (measured in duplicate), heart rate (HR), and arterial-venous oxygen difference (AVO_2 diff) were obtained and systemic vascular resistance (SVR) and PVR determined.

$$\mathrm{PVR} = \frac{\mathrm{MPA(Torr)} - \mathrm{PCWP(Torr)}}{\mathrm{CO(l/min)}} \times 80$$

$$\mathrm{SVR} = \frac{\mathrm{AP(Torr)} - \mathrm{CVP(Torr)}}{\mathrm{CO(l/min)}} \times 80$$

Mean pressures were determined by computer integration of pressure tracings over 3-second sweeps. Repeat hemodynamic profiles were separately obtained at the end of 20 minute IV infusions of nitroglycerin (1 μg/kg/min), phentolamine (150 μg/min), soproterenol (0.02 μg/kg/min), and hydralazine (5 mg Q 5 min ×4). Each agent was administered separately and a 40-minute rest period was allowed between the various medications. Because of the long duration of action of hydralazine it was administered last.

Results

All four drugs decreased pulmonary vascular resistance and increased cardiac output (Table 1). However, only nitroglycerin decreased systolic and mean PA pressures. The other three vasodilator agents reduced PVR by increasing cardiac output. A hemodynamic profile very similar to that achieved with IV nitroglycerin was measured in response to 5 mg of sublingual isosorbide dinitrate (ISN). Outpatient therapy with ISN, nasal oxygen (2 l/min), and warfarin sodium has led to marked symptomatic improvement in the patient with increased exercise tolerance. The pedal edema has resolved as have the signs and symptoms of right-sided heart failure. None of the vasodilators tested altered arterial PO_2 as had been reported in the previous studies.(*13, 14*)

Discussion

There is evidence that pulmonary embolism is associated with vasoconstriction in nonembolized segments of lung.(*15*) Vasoconstriction may result from the release of vasoactive agents and from hypoxia. Unopposed vasoconstriction may eventually lead to irreversible anatomic changes(*16*) and thus it was hoped that vasodilators might provide some benefit in pulmonary hypertension. Oxygen administration and anticoagulant treatment have been reported to reverse pulmonary hypertension secondary to recurrent pulmonary emboli.(*17*)

This case demonstrates beneficial responses to various vasodilators in pulmonary hypertension secondary to recurrent pulmonary emboli. The patient has been maintained on ISN for the past year and continues to do well. He has been active and had had no recurrence of right heart failure.

We conclude that vasodilators can be effective in reducing pulmonary vascular resistance, increasing cardiac output, and relieving dyspnea in secondary pulmonary hypertension resulting from recurrent pulmonary emboli. These data also support the concept of a multifactorial vasoconstrictor etiology for pulmonary hypertension, perhaps involving the alpha and beta adrenergic and smooth muscle receptor systems, since each of the agents used acts by a different receptor mechanism. Empirical therapy with vasodilators may have deleterious effects(*11,12,18-20*) and, therefore, vasodilator therapy for pulmonary hypertension should only be initiated with careful central hemodynamic monitoring.

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NAVMEDCOM Headquarters Phones Change

Effective 31 January 1983, headquarters phone numbers with the prefix 254 will change to 653. In most cases the four-digit number following the prefix will also change. An AIG-7783 message will list the new numbers. Until then, callers dialing the 254 exchange will be referred electronically to the Defense telephone operator, who will provide the new number.

The autovon prefix will not be affected; it will remain 294.

AFHPSP

Members of the Armed Forces Health Professions Scholarship Program (AFHPSP) are eligible to travel within the continental United States aboard DOD-controlled aircraft at any time during their participation in the program. Such travel, however, is subject to the following guidelines.

Students fall into a flight category which is "space available" of a low priority. Members will be assigned seats on aircraft after the personnel listed below have been seated:

- Active duty personnel on emergency leave;
- Active duty personnel on regular leave;
- Dependents of missing or captured personnel; and
- Medal of Honor holders.

Military personnel are required to wear the uniform and must possess a valid Armed Forces I.D. card. Students must carry a valid DD Form 2 (red).

Members of military Reserve components are required to possess an Authentication of Reserve Status for Travel Eligibility (DD Form 1853). These forms may be obtained by forwarding a letter stating the intended travel dates to the Commanding Officer, Naval Health Sciences Education and Training Command (Code 14), Naval Medical Command, National Capital Region, Bethesda, MD 20814. Requests should be forwarded no more than 30 days before the desired travel date. Forms will be issued for a period not to exceed 30 days.

Since students will be traveling in uniform, they must conform to current Navy grooming standards as set forth in U.S. Navy Uniform Regulations. Particular attention should be addressed to hair length and the wearing of articles of jewelry. It should be noted that members who attempt to board aircraft, but fail to comply with such standards, will be denied a seat.

Information concerning flight schedules and seat availability may be obtained from the Passenger Services Section at military air installations. Limited information concerning flight schedules may be obtained by telephone, but be aware that such schedules are subject to frequent last minute changes.

Students should have ample funds available for their trip via commercial carrier in the event a DOD-controlled flight is not available. The student is solely responsible for being at his appointed place of duty at the appointed time.

AFHPSP students are responsible for insuring that their behavior while traveling reflects dignity and credit upon themselves and the Navy. Behavior which does not meet these standards may cause the member to be denied a seat aboard the aircraft and subject the member to disciplinary action.

ACDUTRA

Students serving their 45 days active duty for training (ACDUTRA) may not be aware of the many entitlements during this period. Whether you perform the training at school or at a military medical facility, you are eligible for Navy Exchange and Commissary privileges, discount air travel, medical and dental care for yourself, and military medical care for your family. In addition, your family may receive care from the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). For information on the CHAMPUS program contact the health benefits office at the military facility nearest you.

Additionally, you will be enrolled automatically in the Servicemen's Group Life Insurance Program that provides $35,000 worth of life insurance for a low monthly premium of $4.06.

While on ACDUTRA you will also accrue leave but will not be authorized to take this leave during your ACDUTRA assignment. You will, however, be paid the cost of the leave accrued. Payment for leave is normally made as a part of your last paycheck before completing your ACDUTRA tour.

For further information regarding ACDUTRA, refer to Chapter 5 of your student handbook, or contact the Naval Health Sciences Education and Training Command (Code 14), Naval Medical Command, National Capital Region, Bethesda, MD 20814.

Medical Education Facts*

- U.S. medical school enrollment has increased from 29,473 students in 1958 to 66,485 in 1982.
- In 1958, 6,861 M.D.'s graduated from U.S. medical schools; 15,985 graduated in 1982.
- 16,908 M.D.'s will graduate from the 127 U.S. medical schools in 1986.
- In 1972, 860 (9.0 percent) women graduated from U.S. medical schools. That number increased to 3,991 in 1982 (25 percent).
- In 1961, 14,381 applicants submitted 3.7 applications per person for a total of 53,832 applications; 8,682 were accepted to medical school.
- In 1981, 36,727 applicants submitted 9.3 applications per person and 17,286 were accepted to medical school.
- In 1977, 50.4 percent of the entering medical class had a grade point average of A (3.6-4.0).
- In 1981, 45.8 percent had an A average (3.6-4.0).
- In 1981-82, 3.5 percent medical students repeated their first year; 1.1 percent repeated advanced years.

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*82nd Annual Report on Medical Education in the U.S. 1981-82. *JAMA,* Dec 24/31, 1982.

- Of the 66,485 enrolled in medical school in 1981-82, 320 were dismissed for academic reasons. All but 12 were in the first or intermediate years of school. Total attrition for all reasons was 2.98 percent first year, 1.7 percent intermediate years, and 0.61 percent final year. Total attrition was 1,178 students.
- The mean education debts of graduating seniors was $20,116; 4,192 students reported education debts of more than $20,000.
- Student needs which were not funded in 1981-82 exceeded $16.5 million. This was an increase of 5.8 million over 1980-81.
- There were 67,454 residency positions available in 1980-81. There were 73,784 available in 1981-82.
- 43.7 percent of all residents were training in internal medicine, family practice, and pediatrics.
- In 1981, there were 13,194 foreign medical graduates in all specialties; 5,838 were United States FMG's.
- 27 of the approved U.S. medical schools charge over $10,000/year tuition to state residents (private and public). The highest tuition for 1981-82 year for instate residents was George Washington University ($19,000) and Georgetown ($17,500).
- Fewer than 20 schools use numerical grades; 8 schools give a class rank in each course; 30 schools have a composite class rank by year; 95 schools require Part I of National Boards; 58 of the 95 require a pass for advancement; 86 schools require Part II of National Boards; 42 of the 86 require pass for graduation. □

Augmentation for MSC Officers

Most initial active duty appointments into the Medical Service Corps are made in the Naval Reserve. MSC officers who seek career status achieve this distinction through the process colloquially referred to as "augmentation." This results in reappointment in the Regular Navy for permanent service.

Inasmuch as officers of the Regular Navy serve indefinitely and at the pleasure of the President, commitments for specified periods of service are not required. In addition, Regular officers enjoy certain advantages of career tenure and selectability for future training and education.

Augmentation is a competitive process. This stems from statutes which require that a portion of the active duty force be held in reserve or other nontenured categories. Although there will continue to be limitations on the number of augmentations, the exact number will vary from one augmentation board to the next. These amounts reflect ever changing Navy requirements. For example, over the past 10 years, increasing numbers of MSC officers have elected to remain on active duty beyond their initial obligations and seek augmentation into the Regular Navy. This has reduced available Regular Navy vacancies for augmentation and competition for the limited quota has increased.

The Secretary of the Navy convenes augmentation boards in February and August of each year. Detailed application procedures and eligibility requirements are contained in Article 1020120 of the Naval Military Personnel Manual. Some highlights of the basic eligibility criteria include U.S. citizenship, completion of more than 2 years of active commissioned service, and the ability to complete 20 years of active commissioned service by age 55. Educational achievement enhances one's competitive position for augmentation; however, the determining factor is performance.

Officers who have not previously requested augmentation may submit their applications at any time after becoming eligible. Those who have previously requested augmentation but were unsuccessful in obtaining appointment in the Regular Navy are no longer required to wait 1 year prior to reapplication and may reapply for each successive board. It should be emphasized that all applications are due at the Naval Military Personnel Command (NMPC-211) 60 days before the board convening date. MSC officers who accept augmentation into the Regular Navy agree to remain on active duty for at least 2 years.

U.S. Navy Medicine Goes Bimonthly

Due to Department of Defense budget cuts affecting Navy periodicals, *U.S. Navy Medicine* will now appear every other month.

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Medical Department Officers' Celebration

VADM J. William Cox, MC, Surgeon General of the Navy, announced that the Navy Medical Department Officers' Celebration will be held 19 March 1983 at the Bethesda Naval Hospital Officer's Club.

This year's theme, "Teamwork—A Tradition," highlights collaboration among Medical Department officers who comprise the Medical, Dental, Nurse, and Medical Service Corps.

The uniform for military attendees is Dinner Dress Blue Jacket, with optional Dinner Dress Blue for lieutenant and below. Civilian attire is black tie.

Reservations are required.